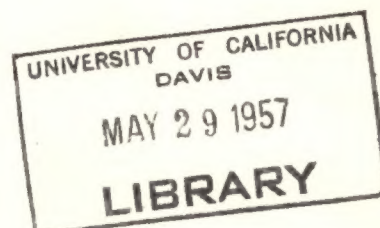




Division of Agricultural Sciences
UNIVERSITY OF CALIFORNIA

FORECASTING PRICES OF SLAUGHTER CATTLE AND HOGS

James B. Hassler



**CALIFORNIA AGRICULTURAL EXPERIMENT STATION
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS**

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FOREWORD AND APPRAISAL

The collection and distribution of basic agricultural statistics is supported by a few continuing and a larger number of single studies that are directed toward drawing inferences from the primary data. Inferences that may be drawn are of two types, namely, structural quantification and forecasting. Both of these areas are extremely important for general policy decisions and orderly production and marketing. In general, public agencies have hesitated to assume the role of advising agriculture on the significance of the crude data when utilized in inferential analysis. With the proper recognition of possible errors that can be made in such inferential reporting, it is likely that these agencies have underestimated the support that the agricultural industry would give to a continuing activity of this type. Current outlook reports are more "artful" than "analytical" and generally are issued on time period bases that are not useful for decision making. A more thorough integration of data collection and inference reporting, keyed to timely dissemination that could permit individual operators to know the industry position and its consequences so that these individuals can arrive at decisions more compatible with personal and industry interests, is needed. This report is a minor contribution to this problem. It should be expanded to the range level and across the entire livestock-feed economy. Extensions to other unified sectors of agriculture would be in order.

The basic appraisal of this study is left to the reader. A few obvious observations are the following:

1. Sizable errors can be made in the forecasting of cattle and hog prices even though the direction of the trend is predicted.
2. Forecasting is more accurate for periods of relative stability in supplies than for periods of violent change.

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observations are the following:

1. Statistic errors can be made in the forecasting of cattle and hog prices even though the direction of the trend is predicted.
2. Forecasting is more accurate for periods of relative stability in supplies than for periods of abrupt change.

4. Forecasts for the last part of the year are usually more accurate than those for the first part of the year.
5. Because of sizable individual errors, the use of these forecasts would be most appropriate for an operation that expected to continue over a period of many years. The average accuracy would more than offset errors on specific decisions.
6. The effects of the Korean conflict are apparent for late 1950 and the full year of 1951.

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16. The following are the names of the persons who have been appointed to the various committees of the Board of Directors of the American Telephone and Telegraph Company, for the year ending December 31, 1900:

The Board of Directors consists of the following members:

1. Mr. J. Edgar Hoover, President

2. Mr. J. Edgar Hoover, Vice President

3. Mr. J. Edgar Hoover, Secretary

4. Mr. J. Edgar Hoover, Treasurer

5. Mr. J. Edgar Hoover, Chairman of the Board

6. Mr. J. Edgar Hoover, Chairman of the Committee on Finance

7. Mr. J. Edgar Hoover, Chairman of the Committee on Management

8. Mr. J. Edgar Hoover, Chairman of the Committee on Legislation

9. Mr. J. Edgar Hoover, Chairman of the Committee on Public Relations

10. Mr. J. Edgar Hoover, Chairman of the Committee on Technical Matters

11. Mr. J. Edgar Hoover, Chairman of the Committee on General Administration

12. Mr. J. Edgar Hoover, Chairman of the Committee on Special Investigations

13. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the United States

14. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the World

15. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the Nation

16. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the People

17. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the Future

18. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the Past

19. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the Present

20. Mr. J. Edgar Hoover, Chairman of the Committee on the Affairs of the World

FORECASTING PRICES OF SLAUGHTER CATTLE AND HOGS

by

James B. Hassler^{1/}

I. Introduction

The research presented in this report is much more restrictive than the title suggests. Specific price forecasts are developed for 900 to 1,100 pound choice slaughter steers and 200 to 220 pound choice slaughter hogs at Omaha and Los Angeles. Potential extensions exist for other grades and classes of slaughter cattle and hogs and for other geographic points, but they have not been covered in this study. Such extensions could be based on relationships to the specific prices considered--both in a geographic as well as a grade and class sense.

The primary objective of this study was the development of a simple, but satisfactory, procedure to forecast monthly average price levels at least six months or more in advance. Information of this nature would have obvious value for feeders in making decisions on replacements and feeding programs. Furthermore, the competitive action of the feed lot operators on the feeder stock market would tend to produce continuously more consistent prices for feeder stock and slaughter stock. This should reduce the amount of windfall losses and gains that occur through time in the livestock industry and should promote more orderly production and marketing patterns.

If price forecasts are widely available to an industry and if the members base their projected plans on these forecasts, there is always the hazard that the forecasts eventually fail to be accurate. An obvious requirement under

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such circumstances is that the forecasts be revised periodically to account for the reactions of the market to the forecasts. Biological aspects of cattle and hog production are generally time oriented and irreversible so that this problem does not appear to be too serious. Furthermore, the forecasting structure to be presented relies partially on lagged price levels and trends and thereby indirectly takes account of the above interrelationships between forecasts, decisions, and realized prices.

II. General Considerations

The purpose of this section is twofold, namely (1) to provide the reader with the broad, logical bases for the forecasting system developed and (2) to outline the system in general terms so that the sequential presentation of its parts will unfold clearly as an integrated structure. Specific comments will be made at relevant points in later sections devoted to the individual components of the system.

A. General Arguments Pertaining to the Model

1. Economic

The United States livestock and meat industry is essentially a closed system since net imports or exports are relatively insignificant. Furthermore, it is an interdependent national marketing structure with no significant isolated, independent areas. The production-consumption balance for major areas tends to remain stable either as a deficit or a surplus for relatively long periods of time. Price differentials tend to conform to transfer costs in this integrated market structure. Consequently, a single major market point in the general surplus area can be chosen to analyze the effects of national economic factors on the price level for slaughter cattle and hogs. Prices at other geographic points can then be related to those at the chosen markets. It

1. Богданов

The United States livestock and meat industry is essentially a

is in this manner that Los Angeles will be related to Omaha on an annual basis. Monthly variations will be handled separately in each market.

The demand for slaughter livestock is directly derived from the demand of consumers for meat products. On an annual period basis, the time interrelationship is assumed to be simultaneous with respect to production and income. Production is taken as the equivalent of consumption--an assumption more valid for beef than pork--since variations in carry-over storage stocks are small compared with annual volumes. Processing and distribution margins are relatively constant over a short period of years. Consequently, the live animal price for a given grade and class of livestock is approximately equal to the weighted average value of the meat times a relatively constant yield factor and then reduced by a nearly constant margin. On this basis one can bypass the processing and distribution level analyses and relate prices for livestock directly to meat supplies and consumer income. All of these remarks refer to economic considerations on an annual basis. They would be inappropriate for shorter time periods.

2. Econometric (Economic Models and Quantification Techniques)

The economic structural relationships underlying an industry (or an economy) are exceedingly complex and most models are merely suggestive, simplified approximations. Furthermore, it is quite probable that no structure is stable over lengthy periods of time, and models postulating stability with quantification based on a long-time series of data produce average structural coefficients that have little consistency with current conditions. This would be particularly undesirable if structural change is gradual, nonrandom, and not easily postulated as a function of time.

is in this paper that for the first time an annual basis. Monthly variations will be handled separately in each

The demand for a particular livestock is directly derived from the demand of consumers for meat products. On an annual period basis, the time interval between the assumed to be simultaneous with respect to production and income. Production is taken as the equivalent of consumption--an assumption more valid for beef than for pork--since variations in carry-over stocks are small compared with annual variations.

Processing and distribution margins are relatively constant over a short period of years. Consequently, the live animal price for a given

type and class of livestock is approximately equal to the weighted average value of the meat times a relatively constant yield factor and then reduced by a nearly constant margin. In this basis one can bypass the processing and distribution level analyses and relate prices for livestock directly to meat supplies and consumer income. All of these remain valid to economic relationships on an annual basis.

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Economic (Economic Models and Quantitative Techniques)

The economic structural relationships underlying an industry (or an economy) are exceedingly complex and most models are merely suggestive, simplified approximations. Furthermore, it is quite probable that no structure is stable over lengthy periods of time and models of data produce average structural coefficients that have little consistency. The structural relationships are constantly changing and not easily predicted. It is structural change is gradual, random, and not easily predicted as a function of time.

The remarks in the last paragraph were directed primarily at the economic functions of a structure but should also be considered for physical interrelationships that are subject to technological change. For these reasons the relationships developed in this report are based on short time series even though such procedures jeopardize the stability of the fitting process through reduced "degrees of freedom." In application through time, it is proposed that the relationships be sequentially recomputed on the basis of dropping a period as new data are available. This procedure should tend to reflect gradual, non-random shifts in the underlying structural relationships.

As stated previously, economic structures are exceedingly complex. The relationships in the system presented in this report are not expected to be more than a logical, but arbitrary, representation. Consequently, for some relationships (primarily the multivariable functions) only linear forms are employed even though more complicated mathematical functions might be appropriate. This simplification is not a serious problem since our primary interest is price forecasting and not structural identification. Furthermore, since it was decided that short time periods should be used, a linear spanning of the localized space should be a reasonable approximation and is more easily accomplished.

The system developed is self-projecting, that is, primary forecasts are dependent on secondary forecasts that are functions of currently available lagged data. Any model to be used for forecasting must have this property, and the system of equations should be established in this manner as the first step. The next step is to quantify the structure using realized data of the past. Forecasts of primary

[illegible]

interest can then be made by employing the forecasts (secondary) of the independent variables in the function that explains the primary variable (dependent). This procedure is used for the "annual" model.

The "monthly" model is essentially nonstructural in a direct economic sense. This does not mean that it is noneconomic. Rather, it is economic but in an indirect, mechanical sense. The monthly analysis is keyed to the annual analysis with the latter setting the general level for the monthly sequences.

Primary components of the monthly model are (1) monthly sequences must be consistent with forecasts of annual average price levels, (2) monthly sequences are well represented by linear runs with critical pivotal points such as April and November (intrasequence) and January and August (intersequence), and (3) the linear runs are computed so as to be consistent with the annual forecasts, the recent price trends, and some measure of seasonality. A secondary, but basic, argument for the procedures used in making the monthly estimates is that the paths of monthly prices tend to be compensatory in their fluctuations around the annual level. These compensating fluctuations are especially relevant for cattle and are probably a function of irreversible ordering of slaughter and the progressive removal of optimism or pessimism generated by market uncertainty. More details about the monthly price forecasting technique will be given later.

Thus far, the discussion in this section has been directed at the concept of a forecasting model. The method of model quantification and the appraisal basis for the results must be considered. These two problems are integral parts of the basic specifications of an economic model, that is, every economic model that is to be quantified must have

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Primary components of the monthly model are (1) monthly responses must be consistent with forecasts of annual, average price levels,

(2) monthly sequences are well represented by linear runs with critical pivotal points such as April and November (interseasons) and January and August (interseasons), and (3) the linear runs are computed so as to be consistent with the annual forecasts, the recent price trends

and some measure of seasonality. A secondary, but basic, argument for the procedure used in making the monthly estimates is that the nature of monthly prices tend to be compensatory in their fluctuations around the annual level. These compensating fluctuations are especially relevant

for cattle and are probably a function of irreversible ordering of slaughter and the progressive removal of optimum or pessimum animals by market uncertainty. More details about the monthly price forecasting technique will be given later.

Thus far, the discussion in this section has been directed at the concept of a forecasting model. The method of model specification and the appropriate basis for the results must be considered. These two problems are interrelated parts of the basic specifications of an economic model; that is, every economic model that is to be quantified must have

economic specifications and error specifications. The error specifications are essential for the determination of the appropriateness of the quantification method and the terminal appraisal (statistical) of the results. Books have been written (and many more will be written) that have been singularly devoted to these problems of quantitative economics. It is hoped that the brevity of this discussion will not be considered synonymous with naivety--they are extremely important subjects and should never be disregarded. The assumption of a stationary time series (essential for a meaningful definition of the fundamental probability distribution for the error specification) is placed under extreme pressure with the dynamic passage of time and especially for forecasting models. Even for models that are logically consistent in their economic and error specifications, the statistical appraisal of their estimates hinges on this concept of a stable probability distribution for the errors. It is a serious weakness of most econometric models that have been developed. Recent work in the area of stockastic processes may provide more flexible and appropriate procedures. The path of economic activity running into the future and its structural connection with the present and past will undoubtedly challenge economists for many years to come, especially with respect to specific details and dynamic components.

In this report error specifications are omitted. The "least squares" procedure was employed to quantify the functions involved. The common statistical measures have been computed for these regression functions and were used only for their descriptive value. Their probabilistic significance was ignored. This attitude was intentional, based partly on the problems pointed out above and partly on the extreme

results. Books have been written (and many more will be written) that have been singularly devoted to these problems of quantitative economics. It is hoped that the gravity of this discussion will not be considered.

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In this report error specifications are omitted. The "least squares" procedure was employed to quantify the functional relationships. The common statistical measures have been computed for these functions and were used only for their descriptive value. Their probabilistic significance was ignored. This attitude was intentional, based partly on the problems pointed out above and partly on the extensive

difficulty of employing them to support the terminal estimates. These terminal estimates are functions of a pyramid of preliminary estimates and the problem of their error specification as functions of primary assumptions is nearly impossible. Consequently, no probability statements are made about the multitude of estimates involved. A rather crude, but reasonable, philosophy was developed to replace this deficiency, namely, the acceptability of the procedure must rest on the results of a period of application. Each reader must decide this issue. Two considerations would be uppermost. Do the results appear to be sufficiently stable and accurate over a period of application? Will this observable stability hold into the future? Probablistically based confidence intervals for the estimates might be an aid but perhaps of no more value than the specific results over a trial period.

B. General Outline of the Forecasting Model

Although the principal objective of this study was the development of monthly average prices, it was found that the forecasting of annual average levels was a necessary and fundamental requirement. Biological aspects of livestock production and the psychological attitudes of people in their economic outlook are keyed to the calendar year. Fundamental data are collected and presented on this basis. Consequently, the calendar year is the annual period used.

In general, three sets of estimates (both annual and monthly) are developed, namely, preliminary, revised, and final. The year is broken into two parts for the monthly forecast sequences--January through July and August through December. For the annual forecasts, a preliminary forecast is made in early August for the coming year, a revised estimate is made in early February, and a final estimate is made in August. For the monthly forecasts, the following estimates are made at the calendar points specified.

Approach through a window. For the annual school day & monthly (continued)

10. What is the purpose of the study? The purpose of the study is to determine the effect of the use of the Internet on the learning of English as a second language.

... ..

1. *Phragmites australis* (Cav.) Trin. ex Steud.

<u>Calendar points</u>	<u>Forecasts</u>
1. Early August	Final forecasts for August-December Preliminary forecasts for January-July
2. Early December	Revised forecasts for January-July
3. Early February	Final forecasts for February-July (Note that January is missed.) Preliminary forecasts for August-December
4. Early May	Revised final forecasts for May-July
5. Early June	Revised forecasts for August-December

Monthly forecasts for both cattle and hogs are made up of two linear segments that pivot on April for the January (February) through July period. Forecasts for cattle during the August through December period follow a single straight line while those for hogs are linear to November with December equal to the previous month's estimate. The annual forecasts are used to insure that the monthly forecasts are consistent with them. The exact details of the procedures that tie the annual and monthly forecasts together will be given later.

Preliminary and revised annual forecasts are computed from two basic equations that are functions of forecasted production per capita of beef plus veal and pork and per-capita disposable income. These results are for the Omaha market as a point in the national structure. Comparable results for Los Angeles are secured from relationships connecting the two markets--one for cattle and one for hogs.

The final annual forecasts (made in early August) for each market are computed from relationships between annual prices and average prices for May, June, and July. This is an indirect economic structure and relies on price levels during these three months to reflect earlier price levels and those for the remainder of the year.

Name	Address
John A. Smith	123 Main St.
Mary E. Jones	456 Oak Ave.
Robert L. Brown	789 Elm St.
Elizabeth C. White	101 Pine St.
James H. Black	202 Cedar St.
Sarah K. Green	303 Birch St.
George F. Hall	404 Spruce St.

The following is a list of the names of the persons who have been admitted to the membership of the Association since the last meeting. The names are given in alphabetical order of the surnames. The names of the persons who have been admitted to the membership of the Association since the last meeting are: John A. Smith, Mary E. Jones, Robert L. Brown, Elizabeth C. White, James H. Black, Sarah K. Green, George F. Hall, and others.

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It should be obvious that all of these relationships must be quantified from past data and must either use lagged data or forecasted values in their application. The remainder of the report will be devoted to the development of the relationships and the forecasted results. Most of the relationships employ data for 1947-1955 or 1949-1955 with 1951 being omitted for some of the value functions. Using the relationships as they would be in actual forecasting, results are given for the 1949-1955 period. These cannot be considered "forecasts" since they are estimated for the period of data used in quantifying the system. Results for 1956 and 1957 are actual forecasts.

That which follows is comprised of three major parts (1) the quantification of the relationships for the annual model, (2) the use of these relationships in making annual forecasts, and (3) the development of the monthly forecasts. A list of definitions for the symbols used will now be given. A loose copy of these definitions has been provided to assist the reader in following the graphs and tables. This makes it unnecessary to repeat these definitions at various points throughout the text and greatly simplifies the notation on graphs and tables.

C. Definitions

P_{BO} = Annual average price per hundredweight for 900 to 1,100 pound choice slaughter steers at Omaha (dollars).

P_{HO} = Annual average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

X_2 = Annual per-capita production of beef and veal in the United States (pounds).

X_3 = Annual per-capita production of pork (excluding lard) in the United States (pounds).

$X_1 = \frac{P_{BO}X_2 + P_{HO}X_3}{100}$ = Annual value of beef, veal, and pork per-capita production when computed with live prices P_{BO} and P_{HO} (dollars).

1. The first of these is the fact that the Commission has not yet received any information from the Government of the United States regarding the activities of the Committee for the Liberation of the Americas (CLA) in the United States. The Commission is therefore unable to determine whether the CLA is a legitimate organization or a subversive one.

1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is assigned to the case. He or she will first determine the nature of the problem and then will attempt to identify the cause of the problem. This is done by gathering information from the various sources available to the investigator. This information may include interviews with the parties involved, review of documents, and other sources of information. Once the cause of the problem has been identified, the investigator will then attempt to develop a plan of action to resolve the problem. This plan may involve the use of various techniques, such as mediation, arbitration, or litigation. The investigator will then implement the plan and will monitor the progress of the investigation. Finally, the investigator will prepare a report of the findings of the investigation and will present the report to the appropriate authorities. This report will contain the investigator's findings, the cause of the problem, and the plan of action that was implemented to resolve the problem. The report will also contain the investigator's recommendations for the future. This report will be used by the appropriate authorities to make decisions regarding the investigation and to develop policies to prevent similar problems from occurring in the future.

1. The first of these is the fact that the United States has a large and growing population of people who are not only not interested in the United States but who are also not interested in the United States. This is a very serious problem for the United States and it is one that we must face. The second of these is the fact that the United States has a large and growing population of people who are not only not interested in the United States but who are also not interested in the United States. This is a very serious problem for the United States and it is one that we must face. The third of these is the fact that the United States has a large and growing population of people who are not only not interested in the United States but who are also not interested in the United States. This is a very serious problem for the United States and it is one that we must face.

$X_1^* = P_{BO}/P_{HD}$ = Ratio of annual average prices defined above.

X_4 = Annual per-capita disposable income in the United States (dollars).

X_5 = Total annual production of beef and veal in the United States (10^9 pounds).

X_6 = Total cattle on farms on January 1 in the United States (10^6 animals). Lagged one year relative to X_5 .

X_7 = Total federally inspected slaughter of beef and veal for January-June in the United States (10^9 pounds).

X_8 = Total fall pigs saved in the United States (10^6 animals).

X_9 = Total spring pigs saved in the United States (10^6 animals).

X_{10} = Total spring pigs saved in the United States (10^6 animals). X_{10} is used in lieu of X_9 at this point to stress that it is being used as the dependent variable. In a temporal sense, X_9 and X_{10} are related by the following relationship, $X_{10,t} = X_{9,t+1}$.

X_{11} = Ratio of fall pigs saved to spring pigs saved in a given year times the annual average hog/corn price ratio (Chicago basis) for a given year. Lagged one year relative to X_{10} .

X_{12} = Total annual production of pork (excluding lard) in the United States (10^9 pounds).

X_{13} = 20 per cent of spring pigs saved in previous year plus fall pigs saved in previous year plus 80 per cent of spring pigs saved in current year (10^6 animals). "Previous" and "current" are relative to the time period for X_{12} .

X_{14} = Total federally inspected slaughter of pork (excluding lard) for January-June in the United States (10^9 pounds).

$\bar{P}_{BO,567}$ = May-July average price per hundredweight for 900 to 1,100 pound choice slaughter steers at Omaha (dollars).

$\bar{P}_{HO,567}$ = May-July average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

P_{BLA} = Same as P_{BO} but for Los Angeles.

P_{HLA} = Same as P_{HO} but for Los Angeles.

$\bar{P}_{BLA,567}$ = Same as $\bar{P}_{BO,567}$ but for Los Angeles.

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P_1, P_2, \dots, P_{12} are used in various tables and are monthly average prices. The context will make it clear whether they refer to cattle or hogs at Omaha or Los Angeles and to actual prices or forecasts.

Primed notation will indicate estimates for all variables other than P_1, P_2, \dots, P_{12} .

III. Development of the Annual Forecasting Structure

A. The Annual Model and Its Quantification (Omaha Market)

For the preliminary, revised, and final estimates (1) of P_{BO} and P_{HO} , two basic equations were employed. These equations are interdependent but were quantified separately. In quantified form, they are as follows:

$$X_1 = 87.751208 - .486749X_2 - .657893X_3 + .020241X_4 \quad (\text{Equation 1})$$

$$X_1^{**} = 4.688117 + .007649X_2 + .075675X_3 + .000211X_4 \quad (\text{Equation 2})$$

From the definitions of X_1 and X_1^{**} , it can be seen that, if X_2, X_3 , and X_4 are known, then X_1' and X_1^{**} can be computed and the relationship between X_1 and X_1^{**} will permit the computation of P_{BO} and P_{HO} . For instance, assume that $X_1' = k_1$ and $X_1^{**} = k_1^{**}$ have been estimated where k_1 and k_1^{**} are specific values. Then, $P_{BO} = k_1^{**} P_{HO}$ results from the definition of X_1^{**} . Substituting in $\frac{P_{BO}X_2 + P_{HO}X_3}{100} = k_1$, we secure $P_{HO} = \frac{100 k_1}{k_1^{**}X_2 + X_3}$ which per-

mits us to compute P_{HO} . Then, P_{BO} will be k_1^{**} times our answer for P_{HO} .

For the procedure to be rational, equations 1 and 2 should be autonomous in an economic sense. Equation 1 can be thought of as an expenditure function, and equation 2 is a relative price function. Variables X_2, X_3 , and X_4 can be considered as predetermined or exogenous variables. From the mathematical relationships connecting X_1 and X_1^{**} through P_{BO}, P_{HO}, X_2 , and X_3 , it is possible to convert equations 1 and 2 into two other functions (rather complex) expressing P_{BO} and P_{HO} directly as functions of X_2, X_3 ,

1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is responsible for the study. The next step is to collect data. This is done by the investigator who is responsible for the study. The next step is to analyze the data. This is done by the investigator who is responsible for the study. The next step is to interpret the results. This is done by the investigator who is responsible for the study. The next step is to draw conclusions. This is done by the investigator who is responsible for the study. The next step is to report the findings. This is done by the investigator who is responsible for the study. The next step is to discuss the implications. This is done by the investigator who is responsible for the study. The next step is to recommend further research. This is done by the investigator who is responsible for the study. The next step is to conclude the study. This is done by the investigator who is responsible for the study.

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10. The following information is for your information:

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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7. Other _____

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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This sheet should be cut out and used as a reading aid.

Definitions

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P_{HO} = Annual average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

X_2 = Annual per-capita production of beef and veal in the United States (pounds).

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$X_1^* = P_{BO}/P_{HO}$ = Ratio of annual average prices defined above.

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X_{12} = Total annual production of pork (excluding lard) in the United States (10^9 pounds).

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P_1, P_2, \dots, P_{12} are used in various tables and are monthly average prices. The context will make it clear whether they refer to cattle or hogs at Omaha or Los Angeles and to actual prices or forecasts.

Primed notation will indicate estimates for all variables other than P_1, P_2, \dots, P_{12} .

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and X_4 . If this were done, the economic interpretation would be complicated as well as the computational problem of fitting. The problem will not be argued further but suffice it to say that the terminal results would differ in the two cases.^{1/} Figures 1, 2, 3, and 4 show how well equations 1 and 2 describe the data for the period used in their quantification.

With these preliminary remarks, it should be clear that the use of equations 1 and 2 in making forecasts of P_{BO} and P_{HO} is contingent on knowing values (forecasts) of X_2 , X_3 , and X_4 . We shall turn now to the problem of making these secondary forecasts. Especially for X_2 and X_3 (but partly for X_4) it is more convenient to forecast total production (disposable income) and total population values to compute the per-capita levels than to estimate the latter directly.

1. Population Forecasting (Including Armed Forces Overseas)

The preliminary forecast would be made in August and not revised in February. On the following August, the official, preliminary July 1 estimate of the Bureau of the Census would be used as a final estimate. The preliminary forecast is based on a ratio estimator.

Let N_i be the preliminary official estimate for July 1 issued by the Bureau of the Census. Let N_{i-1} be the revised official estimate for the previous year. Then, the estimate for the year $i + 1$ is given by $N_{i+1} = \left(\frac{N_i}{N_{i-1}} \right) N_i$. The results of this procedure are given in Table 1

at a later and more useful position.

^{1/} Two linear price functions (one for P_{BO} and one for P_{HO}) were tried but discarded. Both resulted in poor consistency for 1955.

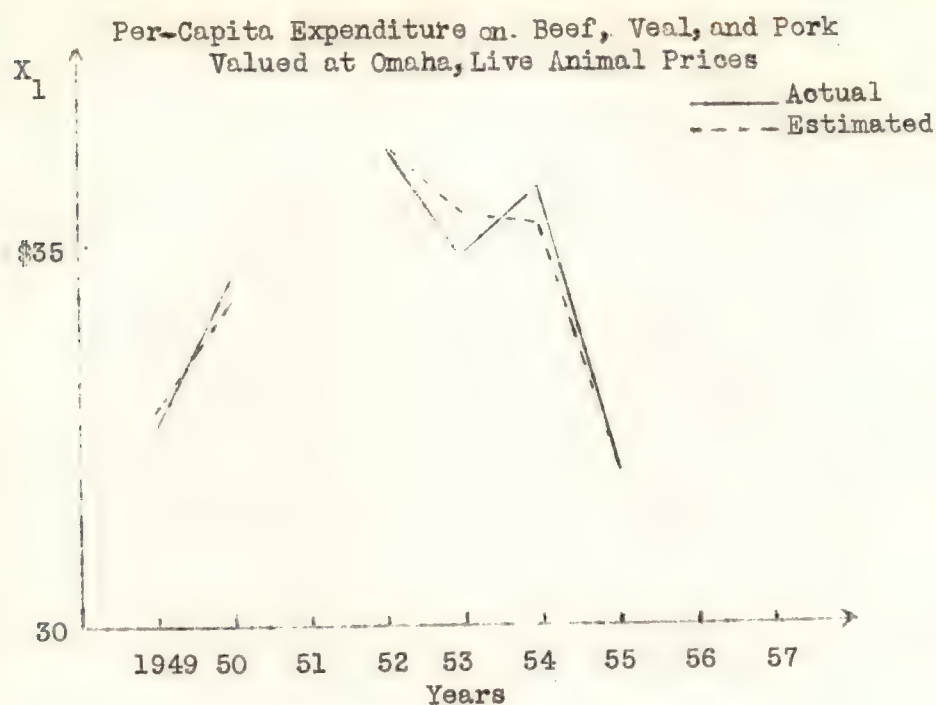
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FIGURE 1



Equation 1

$$X_1' = 87.751208 - .486749X_2 - .657893X_3 + .020241X_4$$

(-6.08) (-4.90) (5.74)

$\bar{R}^2 = .878632$

Data	X_1	X_2	X_3	X_4
1949	32.60	72.2	68.9	1261
50	34.57	71.0	70.6	1359
52	36.29	69.0	73.5	1508
53	34.83	87.6	63.0	1568
54	35.76	90.2	61.3	1569
55	32.01	92.1	66.7	1628

The following table shows the results of the experiments conducted on the 10th of May 1881. The first column gives the number of the experiment, the second column the time taken for the reaction to take place, the third column the amount of gas evolved, and the fourth column the temperature of the reaction mixture.

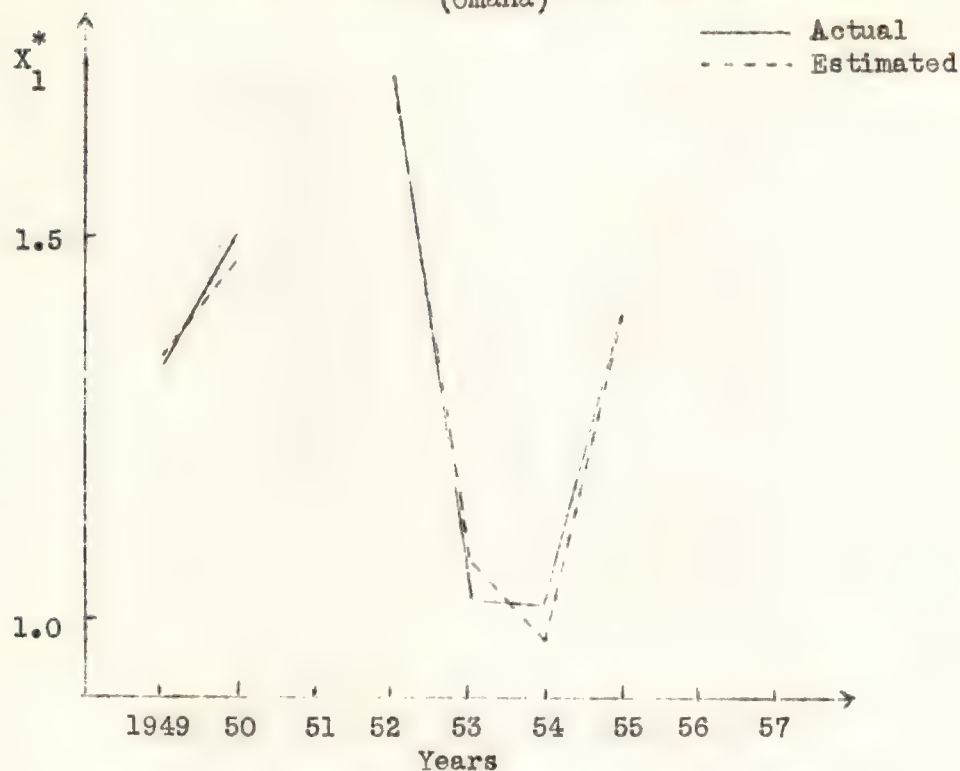
The results of the experiments show that the reaction takes place more rapidly at higher temperatures, and that the amount of gas evolved is greater at higher temperatures. The reaction also takes place more rapidly in the presence of a catalyst.

The following table shows the results of the experiments conducted on the 11th of May 1881. The first column gives the number of the experiment, the second column the time taken for the reaction to take place, the third column the amount of gas evolved, and the fourth column the temperature of the reaction mixture.

Exp.	Time	Gas	Temp.
1	1.20	0.10	15.0
2	1.10	0.12	16.0
3	1.00	0.15	17.0
4	0.90	0.18	18.0
5	0.80	0.20	19.0
6	0.70	0.22	20.0
7	0.60	0.25	21.0
8	0.50	0.28	22.0
9	0.40	0.30	23.0
10	0.30	0.32	24.0

FIGURE 2

Ratio of Choice Steer and Hog Prices
(Omaha)



Equation 2

$$X_1^* = -4.688117 + .007649X_2 + .075675X_3 + .000211X_4 \quad \bar{R}^2 = .963095$$

(1.08) (6.34) (.67)

Data X_1^* (X_2, X_3, X_4 are on Figure 1)

1949	1.330
50	1.506
52	1.719
53	1.027
54	1.017
55	1.409

The first part of the paper is devoted to a discussion of the
 various methods which have been proposed for the determination of
 the rate of reaction between a solid and a liquid. It is shown that
 the most reliable method is that of measuring the change in the
 weight of the solid as the reaction proceeds. This method is
 applicable to all cases in which the solid is insoluble in the
 liquid, and the reaction is not too rapid. It is also applicable
 to cases in which the solid is soluble in the liquid, provided
 that the concentration of the solid is kept low. The second part
 of the paper is devoted to a discussion of the various factors
 which influence the rate of reaction between a solid and a liquid.
 It is shown that the rate of reaction is influenced by the
 nature of the solid, the nature of the liquid, the temperature,
 the surface area of the solid, and the concentration of the
 liquid. The third part of the paper is devoted to a discussion
 of the various theories which have been proposed to explain the
 rate of reaction between a solid and a liquid. It is shown that
 the most satisfactory theory is that of the collision theory, which
 states that the rate of reaction is proportional to the number
 of collisions between the solid and the liquid molecules which
 have sufficient energy to overcome the activation energy of the
 reaction.

FIGURE 3

Annual Average Prices for 900 to 1,100 Pound Choice
Slaughter Steers at Omaha

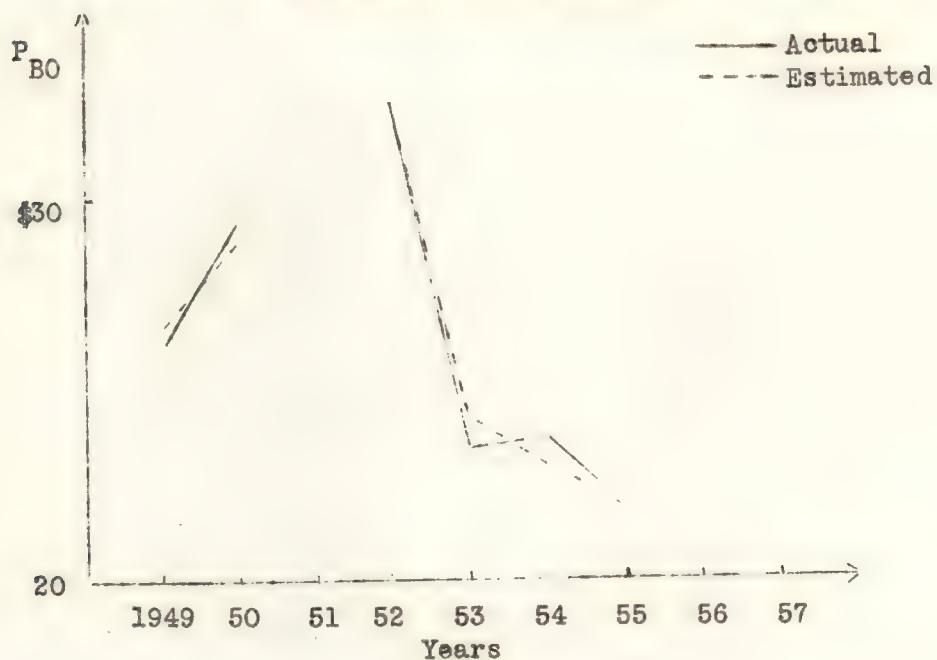
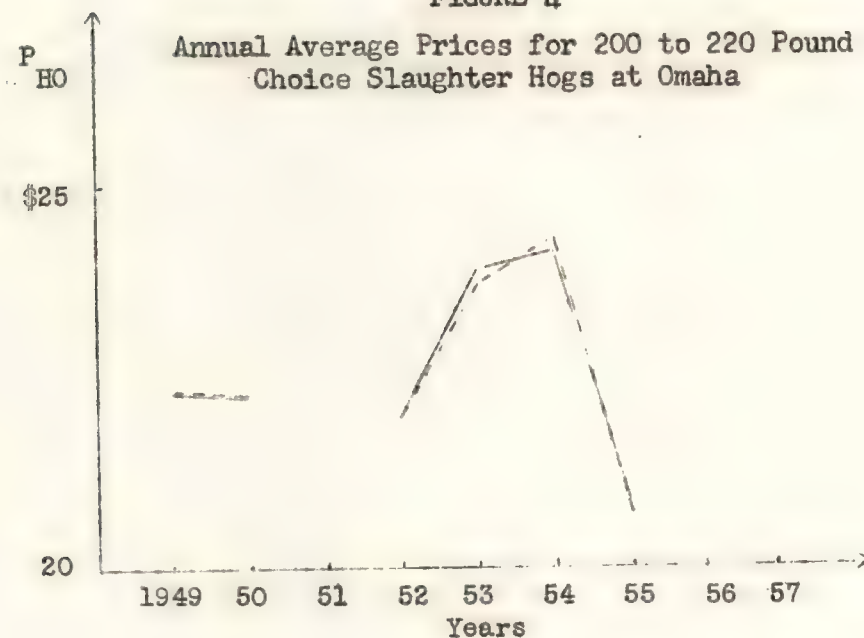


FIGURE 4

Annual Average Prices for 200 to 220 Pound
Choice Slaughter Hogs at Omaha



1. 1915

2. 1916

3. 1917

4. 1918

5. 1919

6. 1920

7. 1921

8. 1922

9. 1923

10. 1924

2. Forecasting Total Beef and Veal Production

The preliminary and revised forecasts of total beef and veal production (X_5) are based on the lagged number of cattle on farms (X_6). Data of this type go through many stages of revision by the U. S. Department of Agriculture. The usual procedure is to issue preliminary reports, then revise the values shortly thereafter, and finally to revise entire series at periodic points connected with better information from censuses and other sources. The following relationship is based on the most recent revised series:

$$X_5' = -10.381911 + .267750X_6 \quad (\text{Equation 3})$$

Figure 5 shows how well this function fits the fundamental data. In practice, preliminary and revised values of X_6 would be employed as they develop over time.

Final forecasts of X_5 are based on total federally inspected production for the period January through June (X_7) as given by the following equation:

$$X_5' = 1.118299 + 2.631390X_7 \quad (\text{Equation 4})$$

Figure 6 shows how consistent this equation is with the basic data.

3. Forecasting Total Pork Production (Excluding Lard)

Although pig production is less seasonal than in earlier years, there still remains a strong tendency to produce in spring and fall cycles. Pig crop reports reflect this fact. Neglecting the compensations that are involved in culling and replacement activities, it has been assumed that pork production should be directly related to the size of the pig crops. Pig development to the marketing weight considered desirable (200 to 220 pounds) requires a period of six to nine

The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly.

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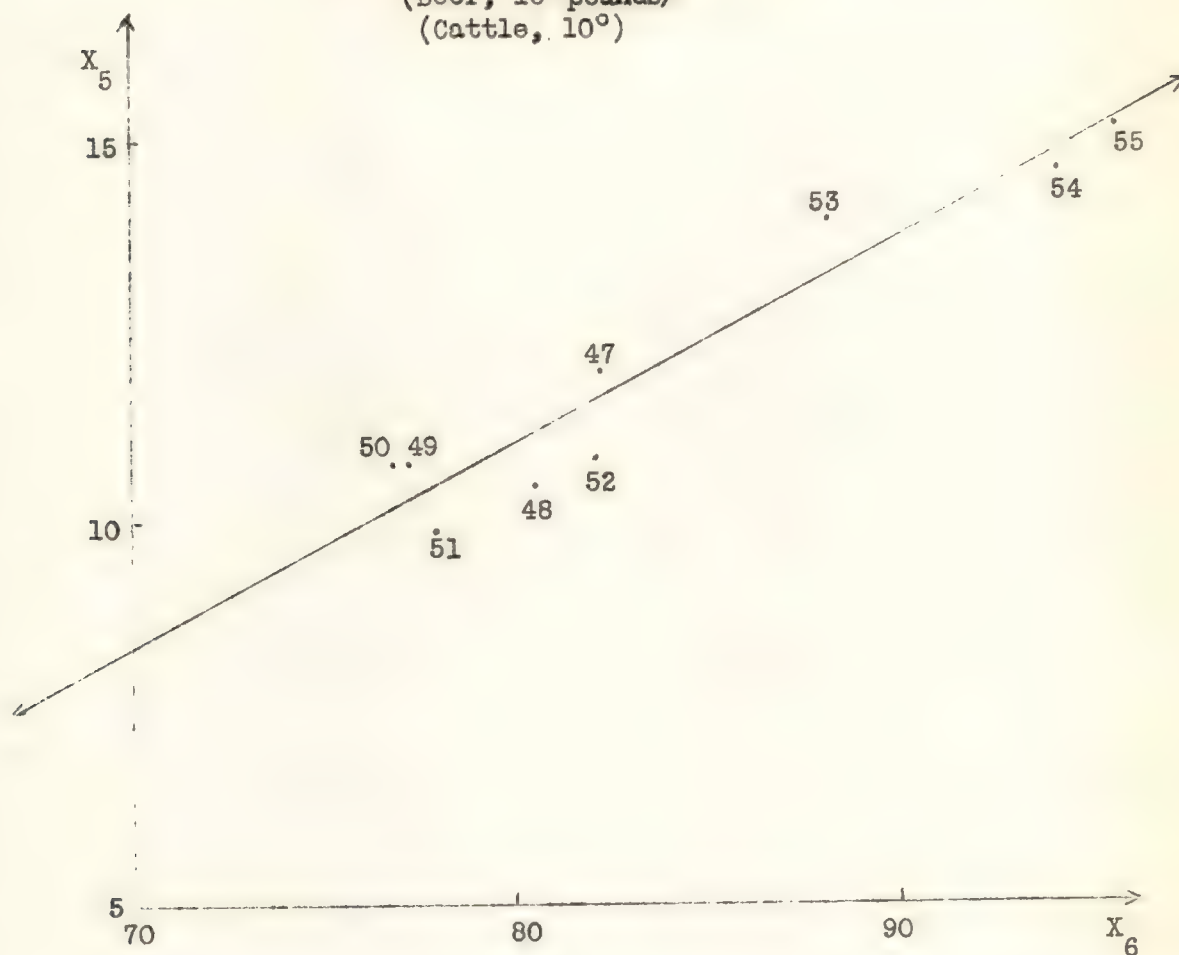
The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly.

1. The following table shows the results of the survey conducted in 1964.

Although the results of the survey are shown in the table below, the table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly. The survey was conducted in 1964 and the results are shown in the table below. The table shows the number of people who responded to the survey and the percentage of people who answered each question correctly.

FIGURE 5

Total Beef and Veal Production in Relation to Lagged Cattle
on January 1 of Previous Year
(Beef, 10^9 pounds)
(Cattle, 10^6)



Equation 3

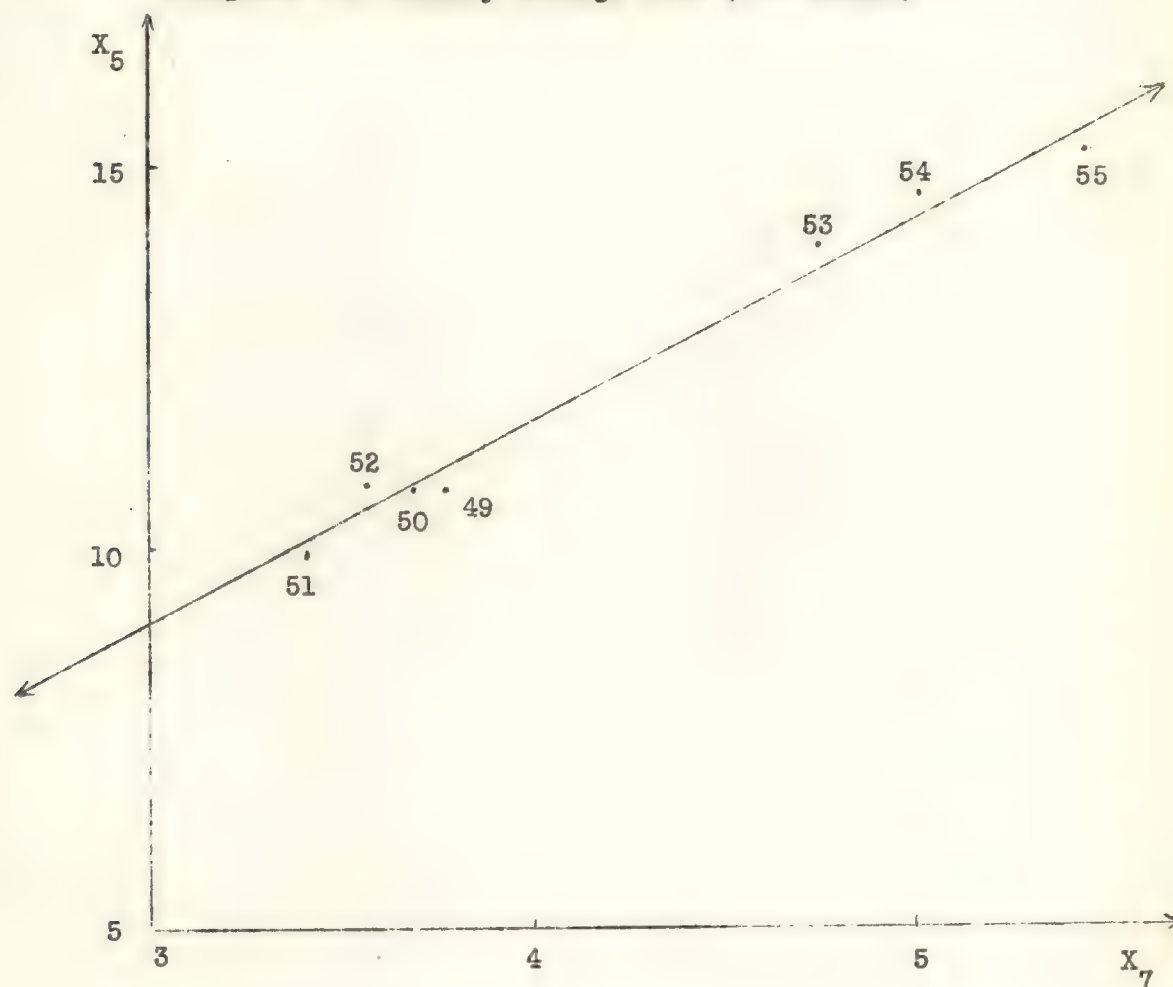
$$X'_5 = -10.381911 + .267750X_6$$

$$r = .955682$$

Data	X_5	X_6
1947	12.037	82.235
48	10.498	80.554
49	10.773	77.171
50	10.768	76.830
51	9.904	77.963
52	10.840	82.083
53	13.989	88.072
54	14.647	94.241
55	15.212	95.679

FIGURE 6

Total Beef and Veal Production in Relation to Federally Inspected
Slaughter for January Through June (10^9 Pounds)



Equation 4

$$X'_5 = 1.118299 + 2.631390X_7$$

$$r = .992819$$

Data	X_5	X_7
1949	10.773	3.772
50	10.768	3.684
51	9.904	3.408
52	10.840	3.567
53	13.989	4.755
54	14.647	5.116
55	15.212	5.456

Received of the Treasurer of the United States the sum of \$100.00 for the year 1917.

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months. Consequently, the pork production of a given year was assumed to be related to the aggregate pig crop formed by adding 20 per cent of the lagged spring crop plus all of the lagged fall crop and 80 per cent of the current spring crop.

Initially, one must forecast the necessary parts of this aggregate. For the preliminary forecast made in August, the size of the fall crop and the coming spring crop must be estimated. The revised forecast of pork production made in February will only necessitate the foreword estimation of the spring crop. Relationships which follow are based on final revised time series. In application, the preliminary and initially revised values of the variables would be employed.

Fall pigs saved (X_8) can be estimated from the size of the current spring crop (X_9) by the following equation:

$$X_8' = -6.134680 + .752821X_9 \quad (\text{Equation 5})$$

Figure 7 gives a graphic representation of this function in relation to the basic data.

To forecast the next spring crop (X_{10}), the following equation was developed:

$$X_{10}' = 3.223202 + .744382X_8 + 3.122504X_{11} \quad (\text{Equation 6})$$

where X_8 is fall crop and X_{11} is the product of the ratio of X_8/X_9 times the annual average hog/corn price ratio on a Chicago basis.

In application, this poses several problems, namely, neither X_8 nor X_{11} will be known by August. The value of X_8 given by equation 5 can be used. Equation 5 can be rewritten as $X_8/X_9 = .752821 - \frac{6.134680}{X_9}$.

In an ex post analysis, it was found that the annual hog/corn ratio could be expressed as a function of the average hog/corn ratio for May through July as follows:

months. Consequently, the best prediction of a given year was obtained by adding to the average crop forecast by adding 25 per cent of the lagged spring crop plus all of the lagged fall crop. The seed of the current spring crop.

Initially, one must forecast the necessary price of this spring crop. For the preliminary (and not made in August) 1951 crop, the spring and the current spring crop were not predicted. The forecast of the current spring crop was made in August.

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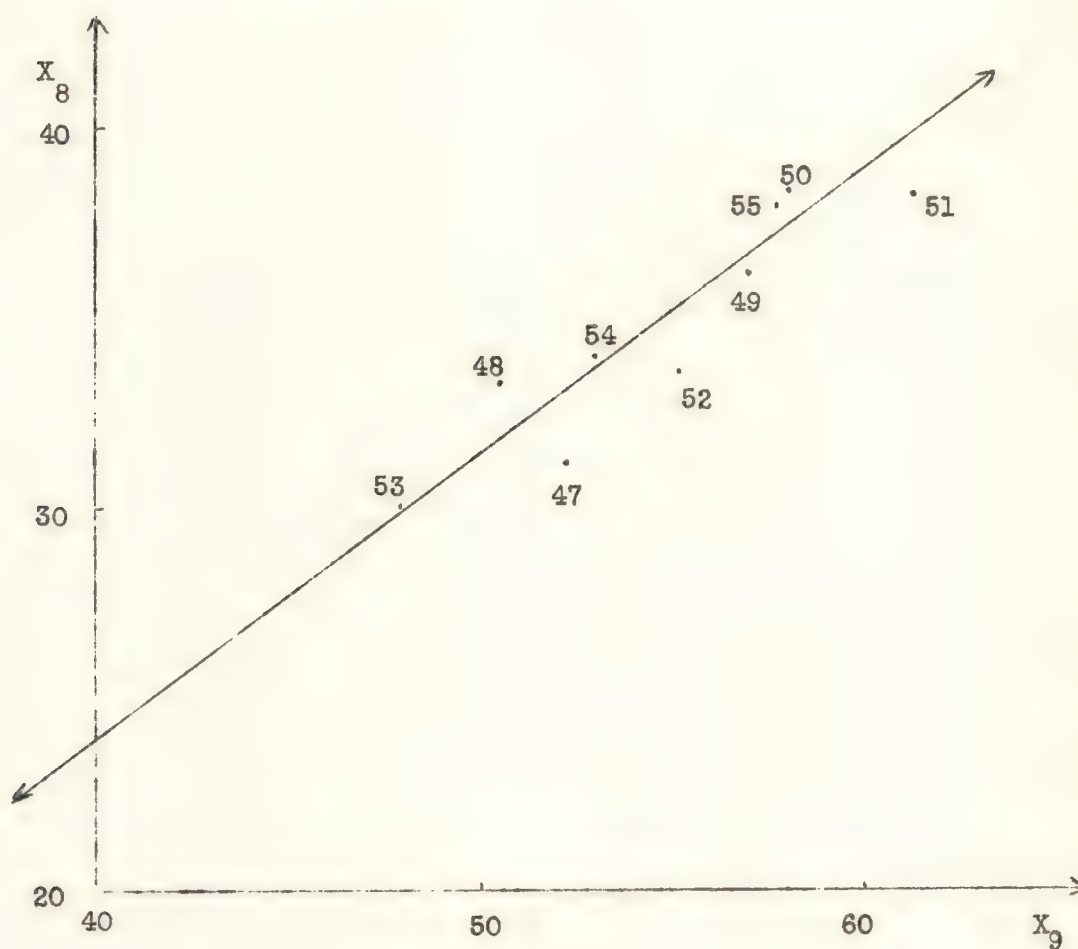
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FIGURE 7

Fall Pigs in Relation to Lagged Spring Pigs Saved (10^6)

Equation 5

$$X'_8 = -6.184680 + .752821X_9$$

$$r = .920658$$

Data	X_8	X_9
1947	31.090	52.199
48	33.358	50.468
49	36.275	56.969
50	39.423	57.958
51	39.288	61.298
52	33.694	55.135
53	29.974	47.940
54	33.978	52.852
55	38.029	57.690

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Year	Value	Year	Value
1960	100.0	1970	100.0
1961	100.0	1971	100.0
1962	100.0	1972	100.0
1963	100.0	1973	100.0
1964	100.0	1974	100.0
1965	100.0	1975	100.0
1966	100.0	1976	100.0
1967	100.0	1977	100.0
1968	100.0	1978	100.0
1969	100.0	1979	100.0
1970	100.0	1980	100.0

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1911

1. The first part of the paper is devoted to a review of the literature on the topic of the paper. It starts with a general overview of the field and then moves on to a more detailed discussion of the specific issues that will be addressed in the paper. The literature review is organized into three main sections: the first section deals with the theoretical aspects of the topic, the second section deals with the empirical aspects, and the third section deals with the policy implications of the research.

[illegible]

For 1947 and 1948 $H/C \text{ (annual)} = 1.133929 H/C \text{ (May-July)}$

For 1949-1955 $H/C \text{ (annual)} = .944734 H/C \text{ (May-July)}$

Consequently, these results can be combined to yield:

$$\begin{array}{ll} \text{For 1947 and 1948} & X_{11} = H/C \text{ (May-July)} \left[.854603 - \frac{7.046804}{X_9} \right] \\ \text{For 1949-1955} & X_{11} = H/C \text{ (May-July)} \left[.712013 - \frac{5.871051}{X_9} \right] \end{array}$$

with the latter being used for future extensions. By February direct values of X_8 and X_{11} would be available.

Figure 8 shows the ex post relationship using final revised time series for the quantification of equation 6.

Total pork production (X_{12}) as a function of total pigs saved with an 80-per cent to 20-per cent split of the spring crop (X_{13}) is given by

$$X'_{12} = 3.522055 + .080028X_{13} \quad (\text{Equation 7})$$

This function is illustrated by Figure 9 and would be used for preliminary and revised forecasts by employing the consistent values for X_{13} . The preliminary forecast (made in August) would involve the use of the preliminary U. S. Department of Agriculture report on spring pigs saved. This report (by ex post observation) appears to be slightly biased and was adjusted by the following equation:

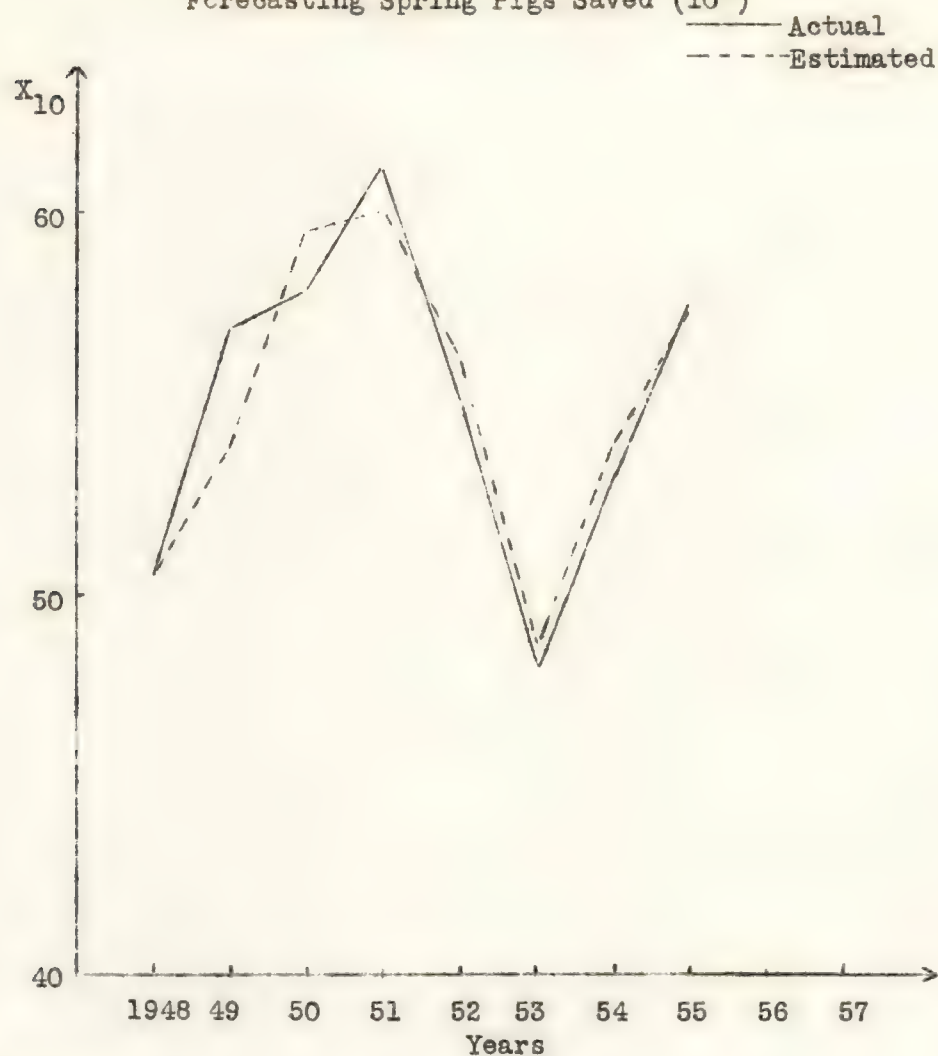
$$\text{Adjusted spring pigs saved} = 2.228235 + .923236 (\text{preliminary spring pigs saved}) \text{ with values expressed in millions of animals.}$$

A similar adjustment was made for the preliminary fall pigs saved as reported by the U. S. Department of Agriculture (for use in the revised estimate of X_{12}) by means of

$$\text{Adjusted fall pigs saved} = -.378077 + .974443 (\text{preliminary fall pigs saved}).$$

(1) The first of these is the fact that the
 (2) second is the fact that the
 (3) third is the fact that the
 (4) fourth is the fact that the
 (5) fifth is the fact that the
 (6) sixth is the fact that the
 (7) seventh is the fact that the
 (8) eighth is the fact that the
 (9) ninth is the fact that the
 (10) tenth is the fact that the

FIGURE 8

Forecasting Spring Pigs Saved (10^6)

Equation 6

$$X'_{10} = 3.223202 + .744382X_8 + 3.122504X_{11}$$

(3.83) (4.68)

$$\bar{R}^2 = .833854$$

Data	X_{10}	X_8	X_{11}
1948	50.468	31.090	7.7
49	56.969	33.358	8.3
50	57.958	36.275	9.4
51	61.298	39.423	8.8
52	55.135	39.288	7.6
53	47.940	33.694	6.5
54	52.852	29.974	9.1
55	57.690	33.978	9.3

1. The first part of the report is a summary of the work done during the year.



2. The second part of the report is a detailed account of the work done during the year.

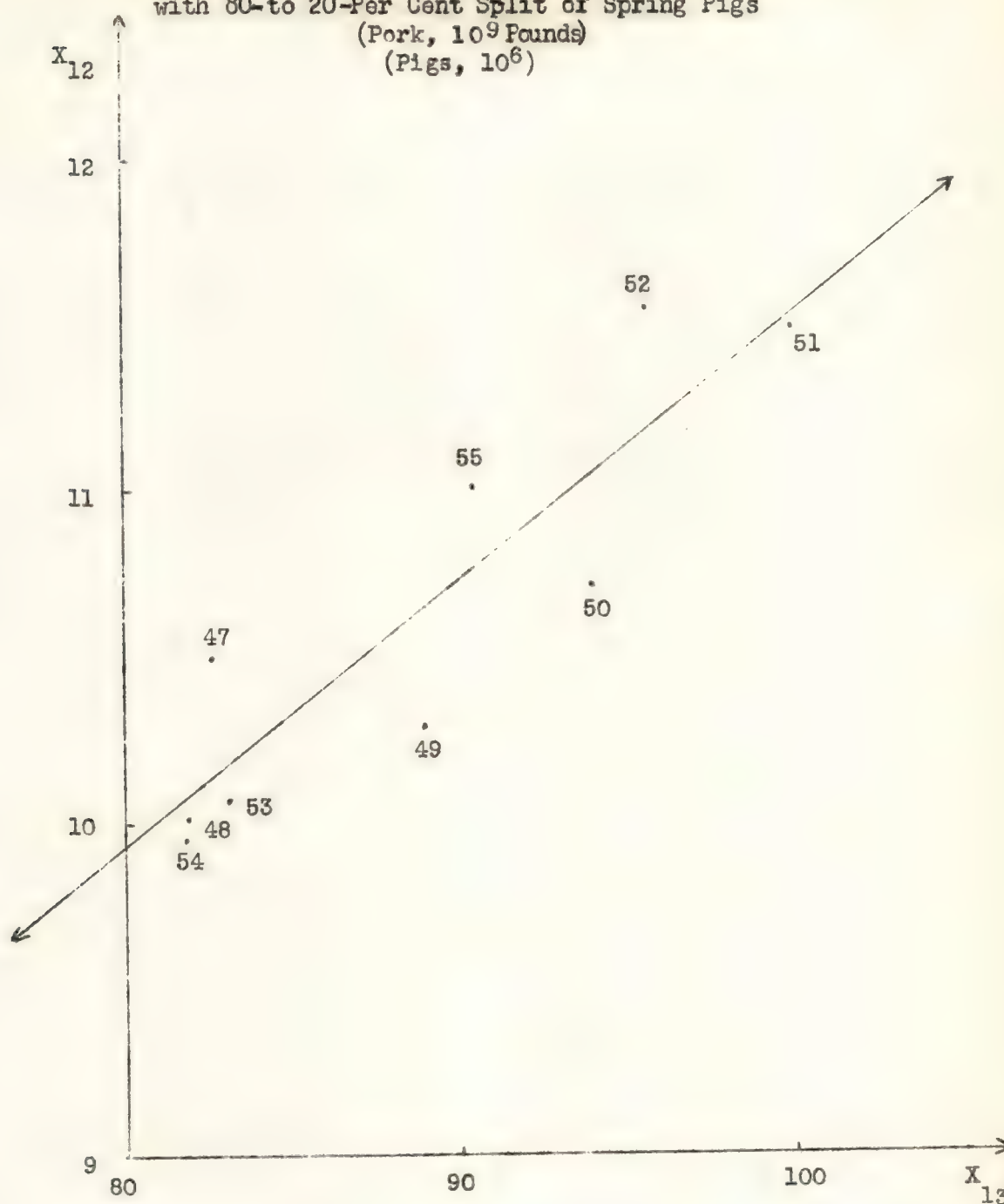
3. The third part of the report is a summary of the work done during the year.

4. The fourth part of the report is a summary of the work done during the year.

Year	Value	Year	Value	Year	Value
1900	100	1901	110	1902	120
1903	130	1904	140	1905	150
1906	160	1907	170	1908	180
1909	190	1910	200	1911	210
1912	220	1913	230	1914	240
1915	250	1916	260	1917	270
1918	280	1919	290	1920	300

FIGURE 9

Total Pork Production in Relation to Total Pigs Saved
with 80-to 20-Per Cent Split of Spring Pigs
(Pork, 10^9 Pounds)
(Pigs, 10^6)



Equation 7

$$X'_{12} = 3.522055 + .080028X_{13}$$

$$r = .892621$$

Data	X_{12}	X_{13}		X_{12}	X_{13}
1947	10.502	82.700	1951	11.483	100.053
48	10.055	81.904	52	11.547	95.656
49	10.286	89.027	53	10.063	83.073
50	10.714	94.035	54	9.952	81.844
			55	11.016	90.422

STATE OF NEW YORK

IN SENATE

JANUARY 18, 1901

REPORT

OF THE

COMMISSIONERS OF THE LAND OFFICE

FOR THE YEAR 1900

LANDS BELONGING TO THE STATE					
ACRES	SQ. YDS.	PERCENT	VAL. \$	RENT \$	REVENUE \$
1,000,000	64,600	100%	100,000	10,000	10,000
500,000	32,300	50%	50,000	5,000	5,000
250,000	16,150	25%	25,000	2,500	2,500
125,000	8,075	12.5%	12,500	1,250	1,250
62,500	4,037	6.25%	6,250	625	625

Equation 7 could be used for making a final forecast of total pork production, but it was found that the total federally inspected slaughter for January through June (X_{14}) was more reliable. This relationship is given by:

$$X_{12}' = 3.626958 + 1.852960X_{14} \quad (\text{Equation 8})$$

and is illustrated by Figure 10.

4. Forecasting Per-Capita Disposable Income

In August of a given year, we would be interested in forecasting next year's average per-capita disposable income. Although more elaborate, economic methods might be developed, we have resorted to a simple temporal trend projection. It can be stated that a revision (lowering) of the growth rate employed probably will have to be made in the future. For the years 1949 through the near future, the following methods was employed. Starting with $X_4 = 1,279$ in 1948, this value was expanded successively by multiplying by 1.035 (a 3.5-per cent annual increase). The results of this method are as follows:

<u>Year</u>	<u>Actual X_4</u>	<u>Projected X_4</u>
1949	1,261	1,324
1950	1,359	1,370
1951	1,465	1,418
1952	1,508	1,468
1953	1,568	1,519
1954	1,569	1,572
1955	1,628	1,627

The projected X_4 values would not be changed for the series of February estimates. By the following August, a final estimate of X_4 would be made.

1. The first of these is the fact that the system is not a simple one. It is a complex system, and the results of the analysis are not always clear. The system is not a simple one, and the results of the analysis are not always clear.

Journal of Management Education 30(6)

1940

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

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1. 1944-1945

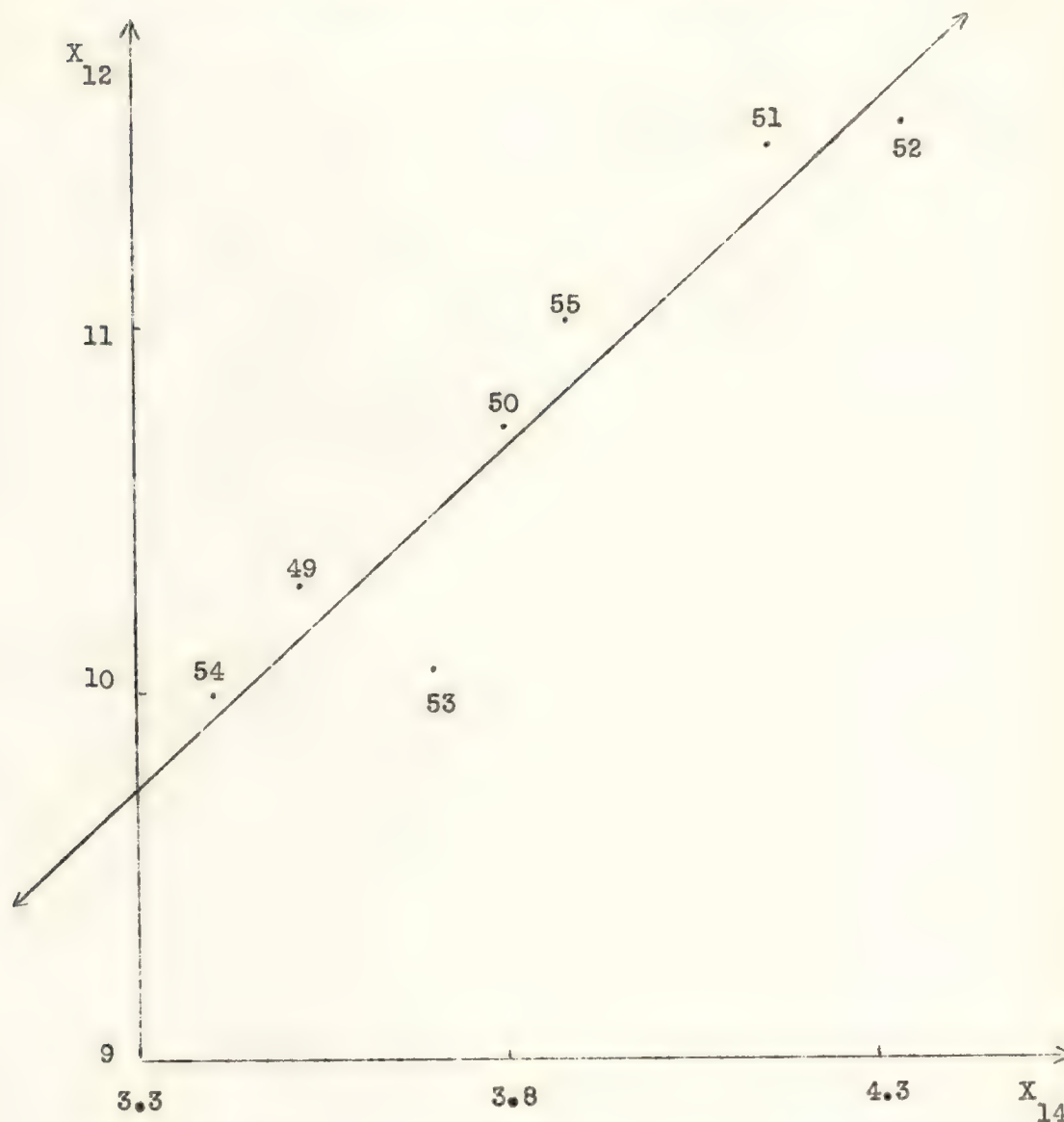
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FIGURE 10

Total Pork Production in Relation to Federally Inspected
Slaughter for January Through June (10^9 Pounds)



Equation 8

$$X'_{12} = 3.626958 + 1.852960X_{14}$$

$$r = .946075$$

Data	X_{12}	X_{14}
1949	10.286	3.522
50	10.714	3.796
51	11.483	4.161
52	11.547	4.341
53	10.063	3.699
54	9.952	3.404
55	11.016	3.884

1. The first part of the paper is devoted to a general discussion of the problem of the existence of solutions of the system of equations



2. The second part of the paper is devoted to a detailed study of the properties of the solutions of the system of equations

Table 1		
x	y	z
0.0	0.0	0.0
0.1	0.1	0.1
0.2	0.2	0.2
0.3	0.3	0.3
0.4	0.4	0.4
0.5	0.5	0.5
0.6	0.6	0.6
0.7	0.7	0.7
0.8	0.8	0.8
0.9	0.9	0.9
1.0	1.0	1.0

It has been observed that the value of $X_{\frac{1}{4}}$ (on annual, seasonally adjusted basis) for the second quarter of the year is a very good indication of the value of $X_{\frac{1}{4}}$ for the entire year. The value of $X_{\frac{1}{4}}$ for the second quarter is computed from the reported total disposable income rate that is released by the Department of Commerce and from the interpolated (centered on May) population estimate based on a linear trend between July 1 of the previous year and July 1 of the current year. Using final revised population and disposable income figures, the following results were developed:

<u>Year</u>	<u>Actual $X_{\frac{1}{4}}$</u>	<u>Estimated second quarter $X_{\frac{1}{4}}$</u>
1948	1,279	1,280
1949	1,261	1,269
1950	1,359	1,326
1951	1,465	1,460
1952	1,508	1,491
1953	1,568	1,575
1954	1,569	1,567
1955	1,628	1,620

5. Final Forecasting (2) of P_{BO} and P_{HO}

It has been found that more accurate final estimates of P_{BO} and P_{HO} can be made by the use of the average price levels for May through July than by relying on equations 1 and 2. Unique marketing conditions developing during a given year appear to be more accurately reflected by this procedure. The following equations were developed on this basis.

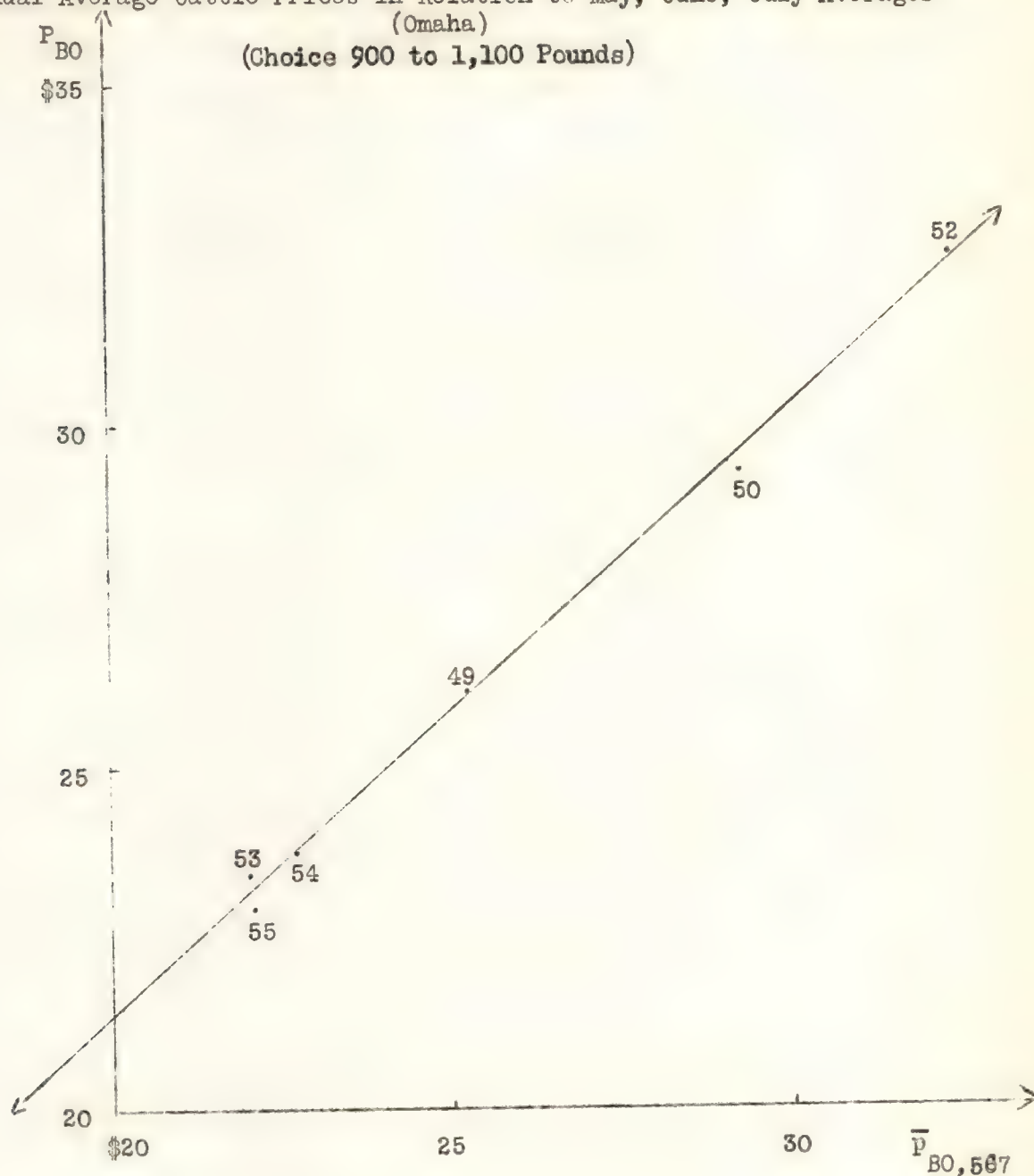
$$P_{BO}' = 3.435222 + .895437 \bar{P}_{BO,567} \quad (\text{Equation 9})$$

$$P_{HO}' = -2.052763 + 1.010851 P_{HO,567} \quad (\text{Equation 10})$$

Figures 11 and 12 illustrate these relationships.

FIGURE 11

Annual Average Cattle Prices in Relation to May, June, July Averages
(Omaha)
(Choice 900 to 1,100 Pounds)



Equation 9

$$P'_{BO} = 3.435222 + .895437\bar{P}_{BO,567}$$

$$r = .997389$$

Data	P_{BO}	$\bar{P}_{BO,567}$
1949	26.14	25.26
50	29.36	29.25
52	32.59	32.38
53	23.43	22.03
54	23.76	22.70
55	22.96	22.08

Journal of the American Medical Association
 (Chicago)
 Volume 100 to 110 (1914-1915)

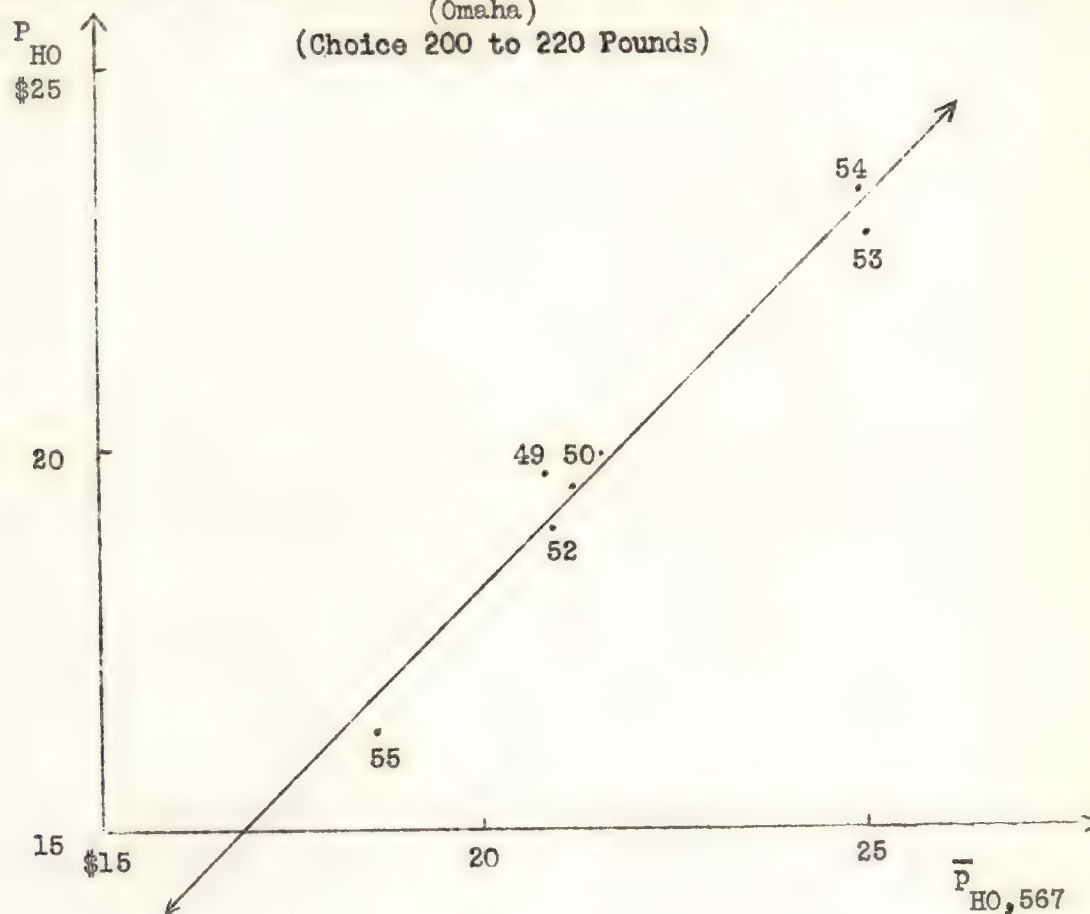


1914-1915 + 1916-1917 = 1918-1919

Year	Value	Value
1914	100.00	100.00
1915	80.00	80.00
1916	60.00	60.00
1917	40.00	40.00
1918	20.00	20.00
1919	10.00	10.00
1920	5.00	5.00

FIGURE 12

Annual Average Hog Prices in Relation to May, June, July Averages
(Omaha)
(Choice 200 to 220 Pounds)



Equation 10

$$P'_{HO} = -2.052763 + 1.010851\bar{P}_{HO,567}$$

$$r = .986239$$

Data	P_{HO}	$\bar{P}_{HO,567}$
1949	19.65	20.81
50	19.49	21.17
52	18.96	20.91
53	22.82	25.06
54	23.37	24.93
55	16.29	18.59

1. The first of the following is a list of the names of the persons who have been named in the following list of names.

(Names of persons named in the list of names.)

2. The second of the following is a list of the names of the persons who have been named in the following list of names.

(Names of persons named in the list of names.)

3. The third of the following is a list of the names of the persons who have been named in the following list of names.

(Names of persons named in the list of names.)

4. The fourth of the following is a list of the names of the persons who have been named in the following list of names.

(Names of persons named in the list of names.)

B. The Annual Model and Its Quantification (Los Angeles Market)

1. Preliminary, Revised, and Final Forecasting (1) of P_{BLA} and P_{HLA}

As indicated earlier, estimates of P_{BLA} and P_{HLA} should be directly related to estimates of P_{BO} and P_{HO} . Logically, this relationship should be linear and should reflect transportation cost differentials from a marginal supply area. However, changes in transportation differentials are minor over short periods of time and the problem of forecasting their levels extremely difficult. Consequently, they were omitted since the evidence for their inclusion was not strong upon analysis. The average transportation cost differential is partly reflected in the constant terms of the following equations:

$$P'_{BLA} = 1.202413 + .951817P_{BO} \quad (\text{Equation 11})$$

$$P'_{HLA} = 3.575027 + .895089P_{HO} \quad (\text{Equation 12})$$

Figures 13 and 14 show these results. In application the relevant estimates for the Omaha market would be used in these equations.

2. Final Forecasting (2) of P_{BLA} and P_{HLA}

As for Omaha, it was found that the May through July average price levels were more accurate bases for estimating P_{BLA} and P_{HLA} than any of the alternate connections with the Omaha forecasts. These results are illustrated by Figures 15 and 16 and by the following equations:

$$P'_{BLA} = .205223 + .974054\bar{P}_{BLA,567} \quad (\text{Equation 13})$$

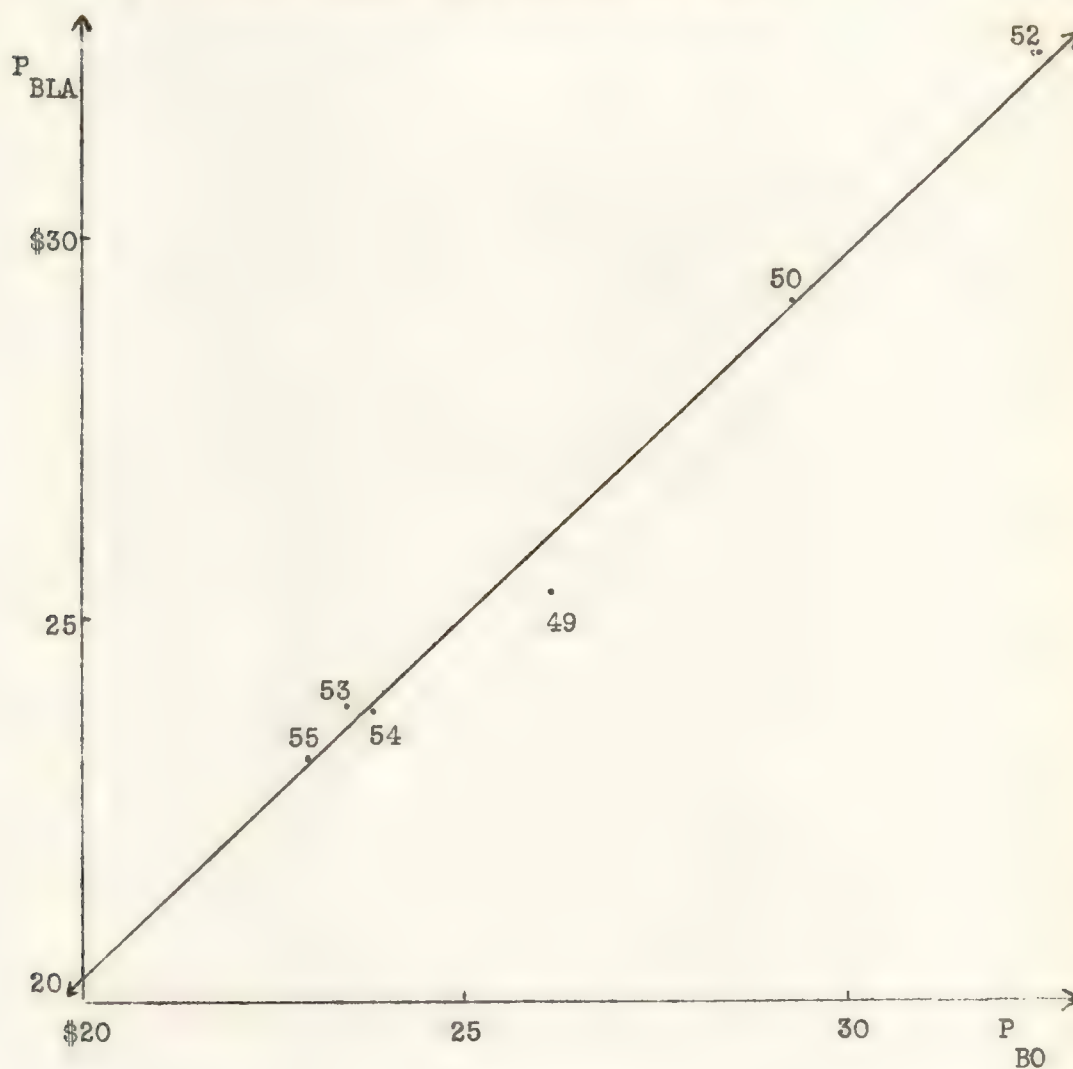
$$P'_{HLA} = -2.229674 + 1.024898\bar{P}_{HLA,567} \quad (\text{Equation 14})$$

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FIGURE 13

Annual Average Prices for 900 to 1,100 Pound
Choice Steers, Los Angeles Vs. Omaha



Equation 11

$$P'_{BLA} = 1.202413 + .951817P_{BO}$$

$$r = .994914$$

Data	P BLA	P BO
1949	25.38	26.14
50	29.14	29.36
52	32.44	32.59
53	23.88	23.43
54	23.83	23.76
55	23.16	22.96

PROBLEM

Let $f(x) = x^2 + 2x + 1$ and $g(x) = x^2 - 2x + 1$.
Find $(f+g)(x)$ and $(f-g)(x)$.



Let $f(x) = x^2 + 2x + 1$

Let $g(x) = x^2 - 2x + 1$

Find $(f+g)(x)$

$(f+g)(x) = (x^2 + 2x + 1) + (x^2 - 2x + 1)$

$= x^2 + 2x + 1 + x^2 - 2x + 1$

$= 2x^2 + 2$

$= 2(x^2 + 1)$

$= 2(x^2 + 1)$

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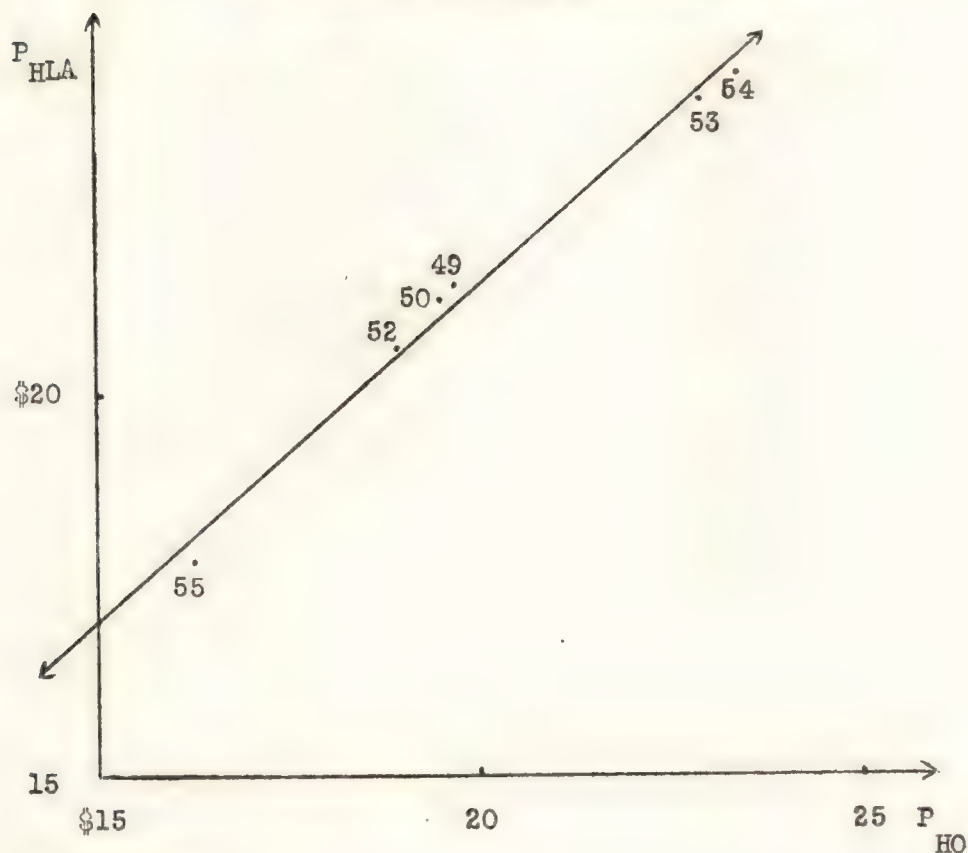
$= 2(x^2 + 1)$

$= 2(x^2 + 1)$

$= 2(x^2 + 1)$

FIGURE 14.

Annual Average Prices for 200 to 220 Pound
Choice Hogs, Los Angeles Vs. Omaha



Equation 12

$$P'_{HLA} = 3.575027 + .895089P_{HO}$$

$$r = .994329$$

Data	P_{HLA}	P_{HO}
1949	21.47	19.65
50	21.27	19.49
52	20.60	18.96
53	23.93	22.82
54	24.28	23.37
55	17.83	16.29

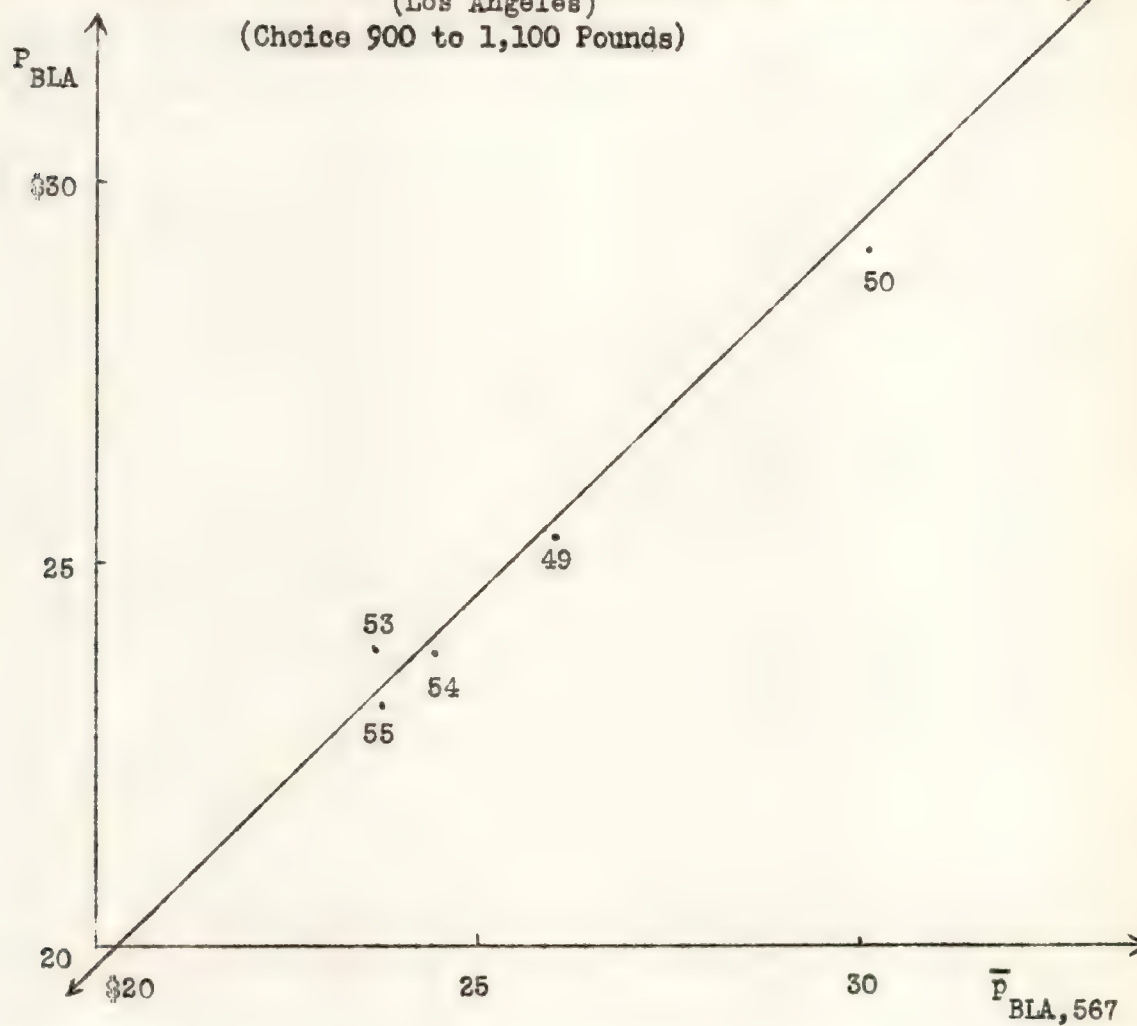
1900

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1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

FIGURE 15

Annual Average Cattle Prices in Relation to May, June, July Averages 52
 (Los Angeles)
 (Choice 900 to 1,100 Pounds)



Equation 13

$$P'_{BLA} = .205223 + .974054\bar{P}_{BLA,567} \quad r = .994139$$

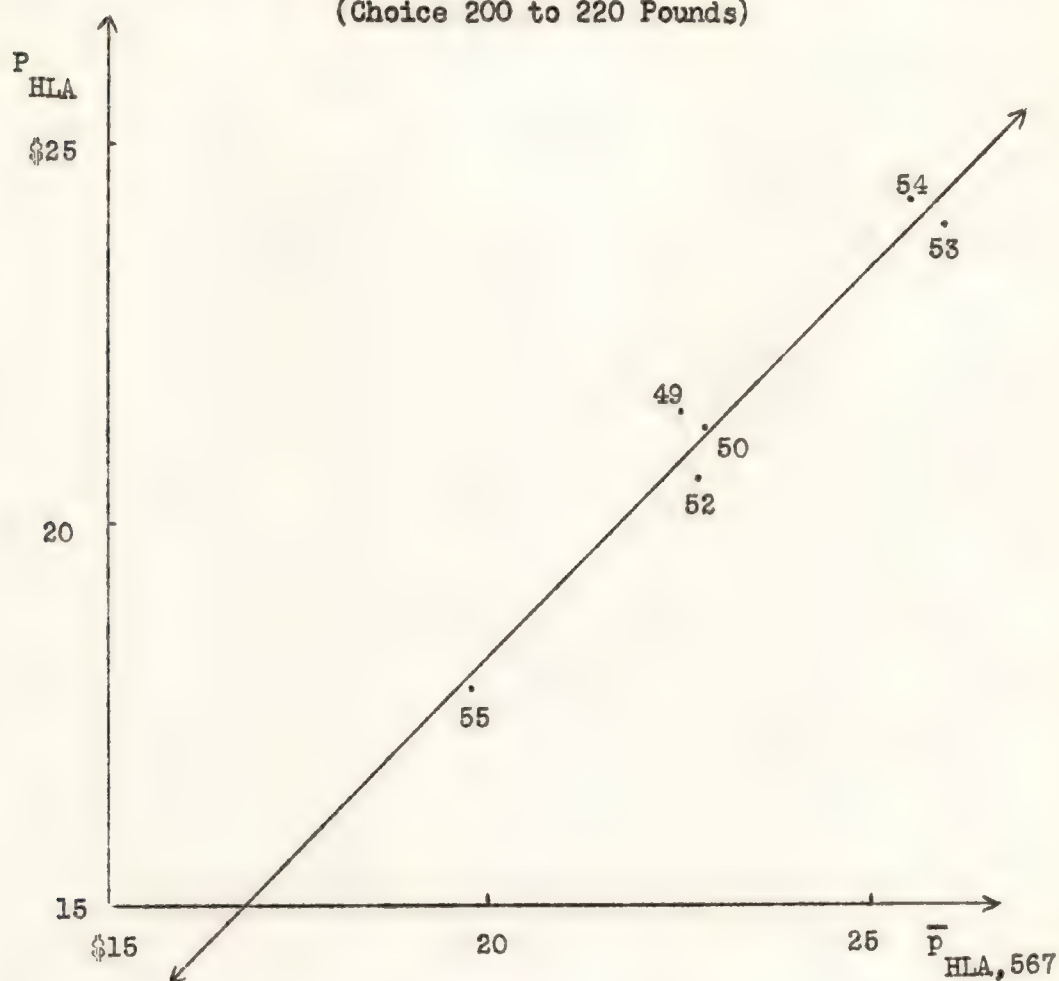
Data	P_{BLA}	$\bar{P}_{BLA,567}$
1949	25.38	26.01
50	29.14	30.14
52	32.44	32.72
53	23.88	23.67
54	23.83	24.46
55	23.16	23.77

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700000 + 800000 =

FIGURE 16

Annual Average Hog Prices in Relation to May, June, July Averages
(Los Angeles)
(Choice 200 to 220 Pounds)



Equation 14

$$P'_{HLA} = -2.229674 + 1.024896\bar{P}_{HLA,567} \quad r = .981618$$

Data	P_{HLA}	$\bar{P}_{HLA,567}$
1949	21.47	22.50
50	21.27	22.82
52	20.60	22.74
53	23.93	25.96
54	24.28	25.51
55	17.83	19.76

Figure 1

Figure 1 shows the relationship between the number of hours of work and the number of hours of sleep. The data points are plotted on a graph with the number of hours of work on the x-axis and the number of hours of sleep on the y-axis. A linear regression line is drawn through the data points, showing a negative correlation. The equation of the line is $y = -0.133x + 8.007$.



Linear Regression

$$y = -0.133x + 8.007$$

Hours of Work	Hours of Sleep
1	7.5
2	7.0
4	6.0
6	4.5
8	2.5

IV. The Annual Forecasts

A. The Omaha Market

1. Population Forecasts (Including Armed Forces Overseas)

Table 1 gives the population data and forecasts employed in the analysis. Columns 1 and 2 are, respectively, the preliminary and revised values reported by the Bureau of the Census. Column 3 is an estimated value based on a linear interpolation between lagged values in column 2 and current values in column 1. Column 4 is self-explanatory and is the set of expansion ratios for estimating values in column 5. Values in column 5 are equal to the product of values found in a lagged row for columns 1 and 4. Relevant comparisons are between columns 1 and 2 and between columns 5 and 2. In both bases the absolute and relative deviations are extremely small.

2. Beef and Veal Production Forecasts

Total beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 3, 4, and 6. Column 7 gives the official revised values reported by the U. S. Department of Agriculture. Figure 17 gives a visual comparison of these values for the period 1949-1957.

Per-capita beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 8, 9, and 10. Column 11 gives the computed values using official revised data reported by the U. S. Department of Agriculture and the Bureau of the Census. Figure 18 gives these results in graphic form.

3. Pig Crops and Pork Production Forecasts

The preliminary, revised, and final forecasts of total spring pigs saved are given in columns 10, 11, and 5 of Table 3. Column 8 of Table 3

2. Population Forecasts (Preliminary, Revised, and Final)

Table 1 gives the population data and forecasts employed in the analysis. Columns 1 and 2 are, respectively, the preliminary and revised values reported by the Bureau of the Census. Column 3 is an estimated value based on a linear interpolation between lagged values in column 2 and current values in column 1. Column 4 is self-explanatory and is the set of correction ratios for estimating values in column 5. Values in column 5 are equal to the product of values found in a lagged row in columns 1 and 4. Notation comparisons are between columns 1 and 2 and between columns 2 and 3. In both cases the absolute and relative deviations are extremely small.

Final and Voted Production Forecasts

Total beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 8, 9, and 10. Column 7 gives the official revised values reported by the U. S. Department of Agriculture. Figure 17 gives a visual comparison of these values for the period 1940-1957.

Graphical data and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 8, 9, and 10. Column 11 gives the current values using official revised data reported by the U. S. Department of Agriculture and the Bureau of the Census. Figure 18 shows these results in graphic form.

3. Beef and Veal Production Forecasts

The preliminary, revised, and final forecasts of total spring pigs are given in columns 10, 11, and 12 of Table 2. Column 9 of Table 2

TABLE 1

Data on United States Population (Including Armed Forces Overseas)

Year	Preliminary July 1 ^{a/}	Revised July 1	Estimated May 15 ^{b/}	Preliminary ₁ divided by revised _{i-1}	Estimated July 1 ^{c/}
	1	2	3	4	5
	10 ⁶ persons			ratio	10 ⁶ persons
1947	144.239	144.126	d/		
1948	146.571	146.631	146.265	1.0170	
1949	149.215	149.188	148.892	1.0176	149.063
1950	151.772	151.683	151.449	1.0173	151.841
1951	154.353	154.360	154.019	1.0176	154.398
1952	157.015	157.028	156.683	1.0172	157.070
1953	159.696	159.643	159.362	1.0170	159.716
1954	162.414	162.409	162.068	1.0174	162.411
1955	165.248	165.248	164.893	1.0175	165.240
1956	168.091		167.736	1.0172	168.140
1957					170.982

a/ Use as final estimate in August for estimating per-capita beef plus veal and pork (final in August).

b/ Use to compute final estimate of per-capita disposable personal income in Table 4, column 2.

c/ Use in making preliminary estimates of per-capita beef plus veal and pork (preliminary in August). Use in making revised estimates of per-capita beef plus veal and pork (revised in February).

d/ Blank spaces indicate no data available or data not relevant to analysis.

Data on United States Population (Including Armed Forces Overseas)

Year	Population, 1940	Population, 1950	Population, 1960	Population, 1970	Population, 1980	Population, 1990	Population, 2000	Population, 2010	Population, 2020
1940	132,629,000	132,629,000	132,629,000	132,629,000	132,629,000	132,629,000	132,629,000	132,629,000	132,629,000
1950	150,697,000	150,697,000	150,697,000	150,697,000	150,697,000	150,697,000	150,697,000	150,697,000	150,697,000
1960	179,325,000	179,325,000	179,325,000	179,325,000	179,325,000	179,325,000	179,325,000	179,325,000	179,325,000
1970	203,717,000	203,717,000	203,717,000	203,717,000	203,717,000	203,717,000	203,717,000	203,717,000	203,717,000
1980	226,545,000	226,545,000	226,545,000	226,545,000	226,545,000	226,545,000	226,545,000	226,545,000	226,545,000
1990	247,917,000	247,917,000	247,917,000	247,917,000	247,917,000	247,917,000	247,917,000	247,917,000	247,917,000
2000	268,917,000	268,917,000	268,917,000	268,917,000	268,917,000	268,917,000	268,917,000	268,917,000	268,917,000
2010	291,325,000	291,325,000	291,325,000	291,325,000	291,325,000	291,325,000	291,325,000	291,325,000	291,325,000
2020	312,629,000	312,629,000	312,629,000	312,629,000	312,629,000	312,629,000	312,629,000	312,629,000	312,629,000

Use as final estimate in August for estimating per-capita beef and pork (final in August).

Use to compute final estimate of per-capita disposable personal income in Table 1, column 2.

Use in computing preliminary estimates of per-capita beef and pork (preliminary in August). Use in making revised estimates of per-capita beef and pork (revised in February).

Blank spaces indicate no data available or data not relevant to the study.

FIGURE 17

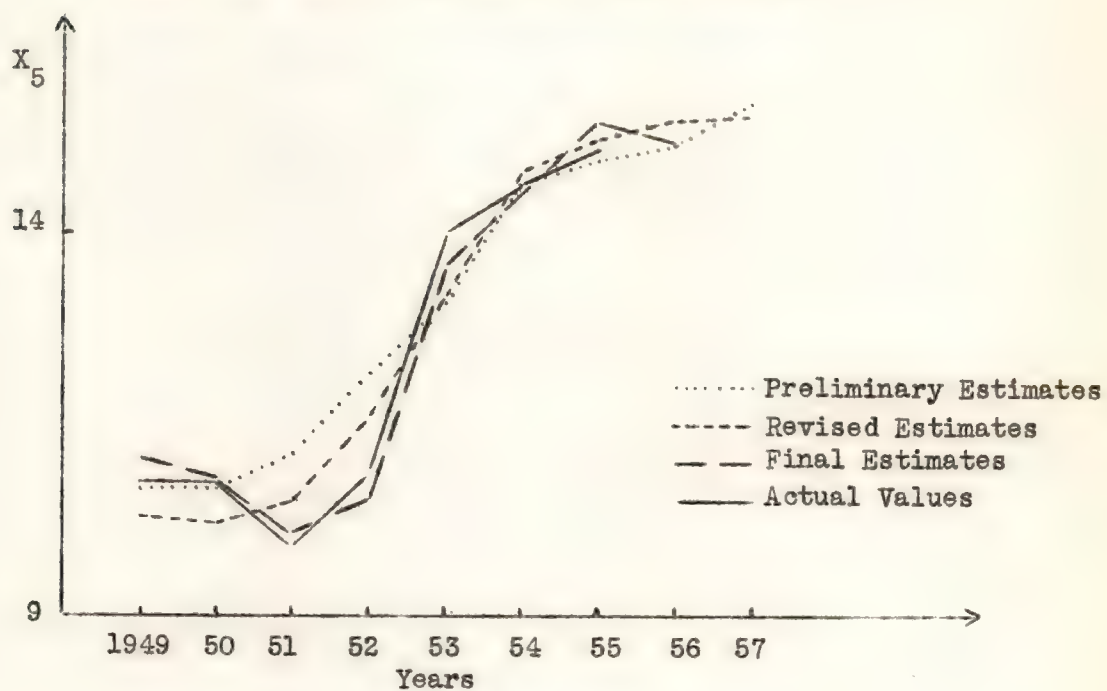
Total Beef and Veal Production (10^9 Pounds)

FIGURE 18

Per-Capita Beef and Veal Production (Pounds)

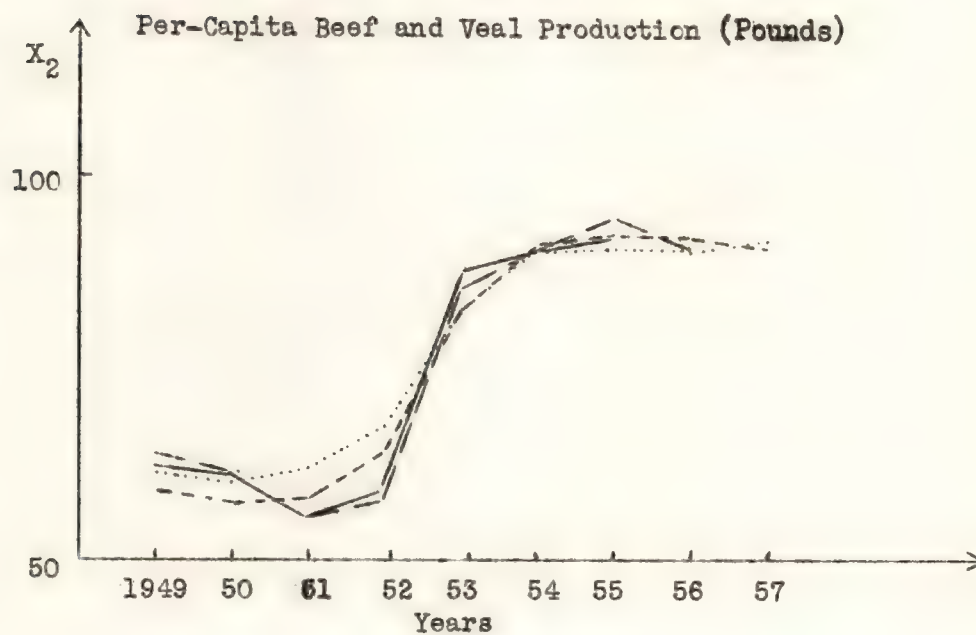


Figure 1

Graph of the function $y = \sin(x)$

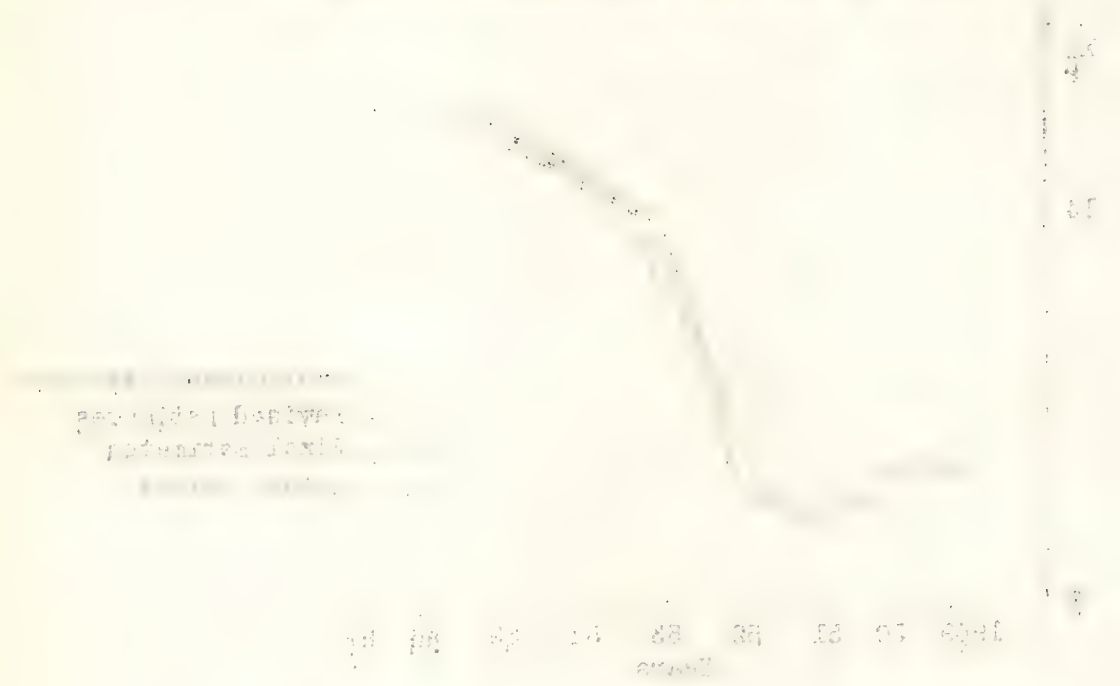


Figure 2

Graph of the function $y = \cos(x)$



TABLE 2

Making Forecasts of Total and Per-Capita Beef and Veal Production

Year	Preliminary January 1 cattle and calves	Revised January 1 cattle and calves	Preliminary estimate of total beef and veal ^{a/}	Revised estimate of total beef and veal ^{b/}	Total federally inspected slaughter January through June	Final estimate of total beef and veal ^{c/}	Revised total beef and veal	Preliminary estimate of per- capita beef and veal pro- duction ^{d/}	Revised estimate of per- capita beef and veal pro- duction ^{e/}	Final estimate of per- capita beef and veal pro- duction ^{f/}	Actual per- capita beef and veal pro- duction ^{g/}
	1	2	3	4	5	6	7	8	9	10	11
	10 ⁶ animals		10 ⁹ pounds				pounds per capita				
1947	81.050	80.554	-- ^{h/}	--	--	--	--	--	--	--	--
1948	78.564	77.171	11.319	11.186	--	--	--	--	--	--	--
1949	78.495	76.830	10.654	10.281	3.772	11.044	10.773	71.5	69.0	74.0	72.2
1950	80.277	77.963	10.635	10.189	3.684	10.812	10.768	70.0	67.1	71.2	71.0
1951	84.179	82.083	11.112	10.493	3.408	10.086	9.904	72.0	68.0	65.3	65.3
1952	88.062	88.072	12.157	11.596	3.567	10.504	10.840	77.4	73.8	66.9	69.0
1953	93.696	94.241	13.197	13.199	4.755	13.631	13.989	82.6	82.6	85.4	87.6
1954	94.677	95.679	14.705	14.851	5.116	14.580	14.647	90.5	91.4	89.8	90.2
1955	95.433	96.592	14.968	15.236	5.456	15.475	15.212	90.6	92.2	93.6	92.1
1956	97.465	96.804	15.170	15.481	5.350	15.196		90.2	92.1	90.4	
1957	95.166		15.714	15.537				91.9	90.9		
1958	<u>i/</u>		15.099								

^{a/} Use lagged value in column 1 in equation 3.

^{b/} Use lagged value in column 2 in equation 3.

^{c/} Use value in column 5 in equation 4.

^{d/} Equal to column 3, Table 2 divided by column 5, Table 1.

^{e/} Equal to column 4, Table 2 divided by column 5, Table 1.

^{f/} Equal to column 6, Table 2 divided by column 1, Table 1.

^{g/} Equal to column 7, Table 2 divided by column 2, Table 1.

^{h/} Dashes indicate values omitted because they are not relevant to the analysis.

^{i/} Blank spaces indicate data not available.

TABLE 3

Making Forecasts of Total Spring and Fall Pig Crops

Year	May-July hog/corn price ratio (Chicago basis)	Esti- mated annual average hog/corn price ratio	Actual annual average hog/corn price ratio	Prelimi- nary spring pigs saved	Adjusted prelimi- nary spring pigs saved ^{a/}	Prelimi- nary fall pigs saved	Adjusted prelimi- nary fall pigs saved ^{b/}	Revised spring pigs saved	Revised fall pigs saved	Prelimi- nary estimate of spring pigs saved ^{c/}	Revised esti- mate of spring pigs saved ^{d/}	Prelimi- nary estimate of fall pigs saved ^{e/}
	1	2	3	4	5	6	7	8	9	10	11	12
				10 ⁶ animals								
1947	11.7	13.3	12.9	53.151	51.299	31.352	30.173	52.199	31.090	f/		32.448
1948	10.7	12.1	12.5	51.421	49.702	33.995	32.748	50.468	33.358	53.606	49.102	31.244
1949	14.8	14.0	14.7	59.040	56.736	37.262	35.934	56.969	36.275	50.212	52.893	36.545
1950	13.7	12.9	12.9	60.079	57.695	40.657	39.240	57.958	39.423	58.529	59.011	37.268
1951	12.6	11.9	11.8	63.818	61.147	40.182	38.777	61.298	39.288	56.882	59.599	39.870
1952	11.4	10.8	10.7	56.607	54.490	35.355	34.073	55.135	33.694	57.257	55.507	34.853
1953	16.0	15.1	14.6	50.726	49.060	31.882	30.689	47.940	29.974	50.712	49.195	30.760
1954	15.1	14.3	14.5	56.066	53.990	36.766	35.448	52.852	33.978	55.784	54.170	34.476
1955	12.3	11.6	11.4	60.453	58.041	37.914	36.567	57.690	38.029	57.301	59.898	37.529
1956	10.8	10.2	10.7	53.085	51.238	36.535	35.223	53.136		54.578	52.925	32.402
1957										47.327	51.612	

^{a/} Based on values in column 4, Table 3, adjusted by method indicated on page 21 of text.

^{b/} Based on values in column 4, Table 3, adjusted by method indicated on page 21 of text.

^{c/} Based on lagged values in columns 2, 5, and 12, Table 3, used in equation 6.

^{d/} Based on lagged values in columns 3, 7, and 8, Table 3, used in equation 6.

^{e/} Based on values in column 5, Table 3, used in equation 5.

^{f/} Blank spaces indicate no data available or data not relevant to analysis.

gives the revised official values reported by the U. S. Department of Agriculture. These values are portrayed on Figure 19. The final forecasts are omitted since they are merely adjusted preliminary values reported by the U. S. Department of Agriculture.

The preliminary and final forecasts of total fall pigs saved are given in columns 12 and 7 of Table 3. Column 9 represents the revised official values reported by the U. S. Department of Agriculture.

Figure 20 shows the results in graphic form. The final forecasts are adjusted preliminary values reported by the U. S. Department of Agriculture and are omitted.

Columns 2, 3, and 4 of Table 4 give the preliminary, revised, and final forecasts of total pork production. Column 5 gives the revised official estimates of the U. S. Department of Agriculture. These values are presented on Figure 21.

The preliminary, revised, and final forecasts of per-capita pork production are found in columns 6, 7, and 8 of Table 4. Column 9 gives the values computed from official revised production data of the U. S. Department of Agriculture and population figures of the Bureau of the Census. These values are presented on Figure 22.

4. Per-Capita Disposable Income Forecasts

Preliminary and final forecasts of United States annual per-capita disposable income are found in columns 2 and 4 of Table 5. Official Department of Commerce figures are given in column 1. Figure 23 presents these results.

5. Forecasts of X_1 and X_1^*

Table 6 gives these results and is self-explanatory. These estimates are computed by using forecasts of X_2 , X_3 , and X_4 in equations 1 and 2.

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FIGURE 19

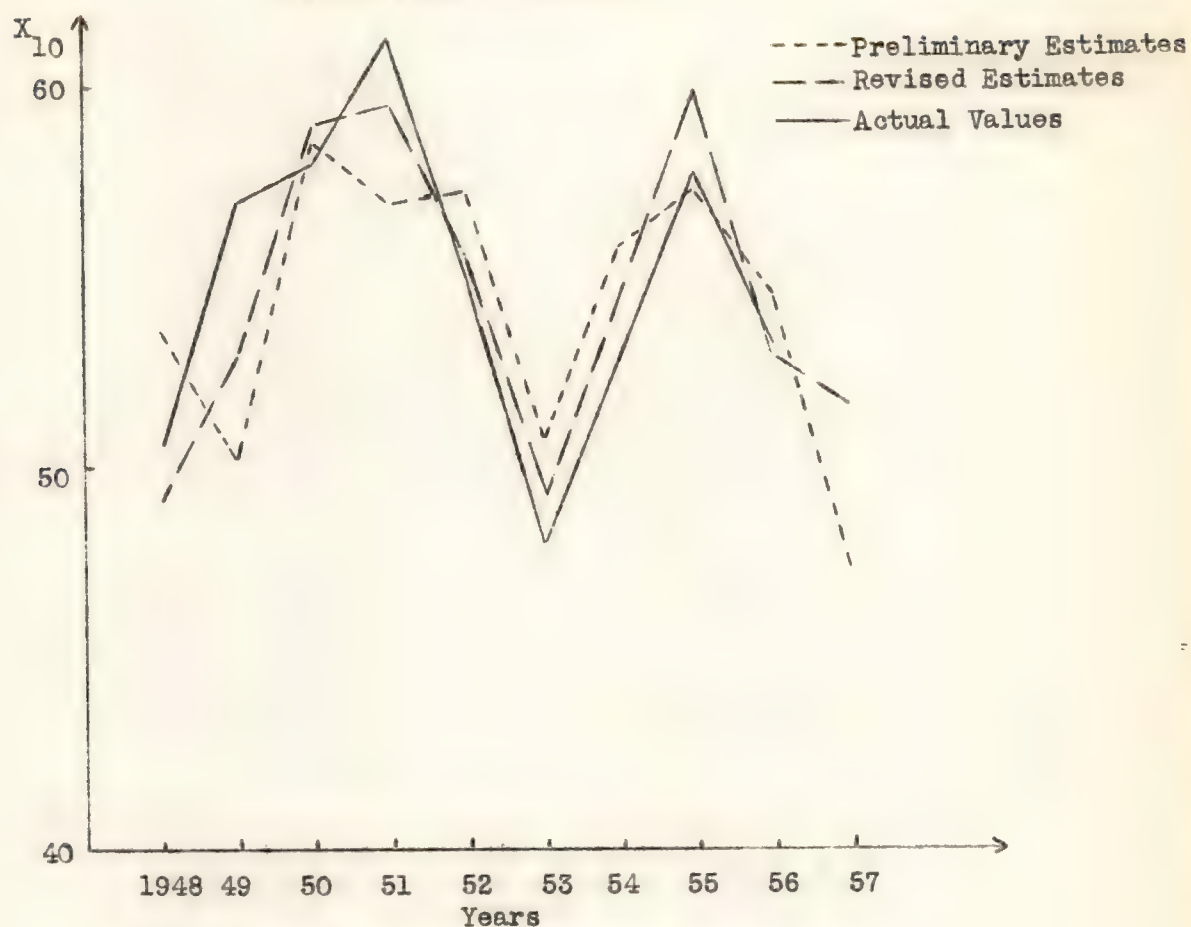
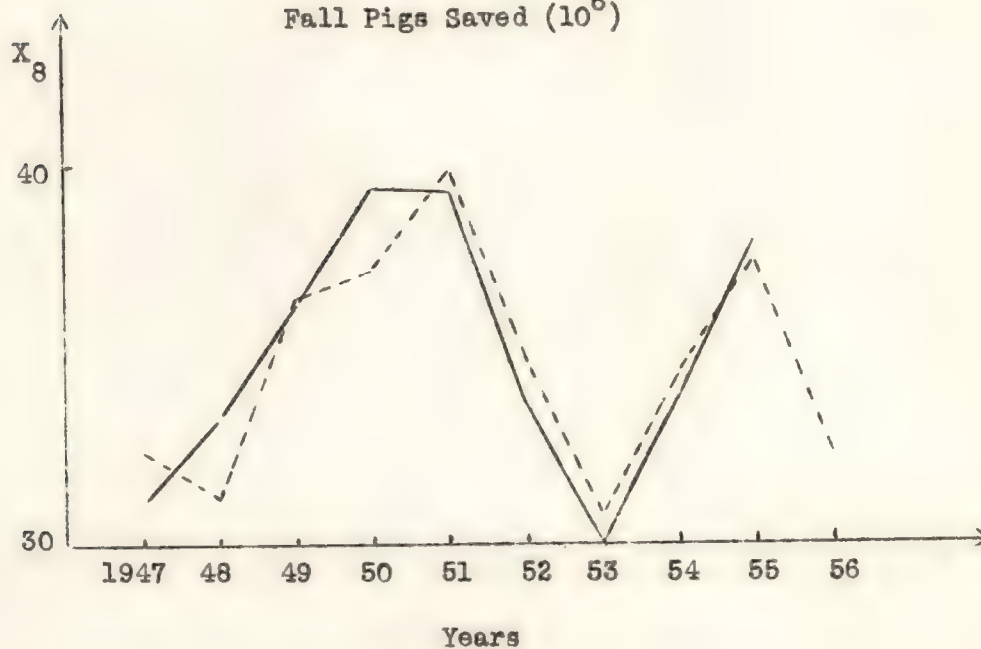
Spring Pigs Saved (10^6)

FIGURE 20

Fall Pigs Saved (10^6)

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

TABLE 4

Making Forecasts of Total and Per-Capita Pork Production

Year	January-June federally inspected slaughter	Prelimi- nary estimate of total pork production ^{a/}	Revised estimate of total pork production ^{b/}	Final estimate of total pork production ^{c/}	Revised total pork production	Prelimi- nary estimate of per-capita pork production ^{d/}	Revised estimate of per-capita pork production ^{e/}	Final estimate of per-capita pork production ^{f/}	Actual per-capita pork production ^{g/}
	1	2	3	4	5	6	7	8	9
	10 ⁹ pounds					pounds			
1947	3.506			10.123	10.502	^{h/}		70.2	72.9
1948	3.422	10.372	9.900	9.968	10.055			68.0	68.6
1949	3.522	10.033	10.337	10.153	10.286	67.3	69.3	68.0	68.9
1950	3.796	11.102	11.088	10.661	10.714	73.1	73.0	70.2	70.6
1951	4.161	11.070	11.406	11.337	11.483	71.7	73.9	73.4	74.4
1952	4.341	11.357	11.160	11.671	11.547	72.3	71.1	74.3	73.5
1953	3.699	10.430	10.281	10.481	10.063	65.3	64.4	65.6	63.0
1954	3.404	10.340	10.213	9.934	9.952	63.7	62.9	61.2	61.3
1955	3.884	10.814	11.040	10.824	11.016	65.4	66.8	65.5	66.7
1956	4.455	10.949	10.760	11.882		65.1	64.0	70.7	
1957		9.965	10.496			58.3	61.4		

^{a/} Based on 80 per cent of values in column 10, Table 3, plus 20 per cent of lagged values in column 5, Table 3, plus lagged values in column 12, Table 3, used in equation 7.

^{b/} Based on 80 per cent of values in column 11, Table 3, plus 20 per cent of lagged values in column 8, Table 3, plus lagged values in column 7, Table 3, used in equation 7.

^{c/} Based on values in column 1, Table 4, used in equation 8.

^{d/} Column 2, Table 4, divided by column 5, Table 1.

^{e/} Column 3, Table 4, divided by column 5, Table 1.

^{f/} Column 4, Table 4, divided by column 1, Table 1.

^{g/} Column 5, Table 4, divided by column 2, Table 1.

^{h/} Blank spaces indicate no data available or data not relevant to analysis.

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FIGURE 21

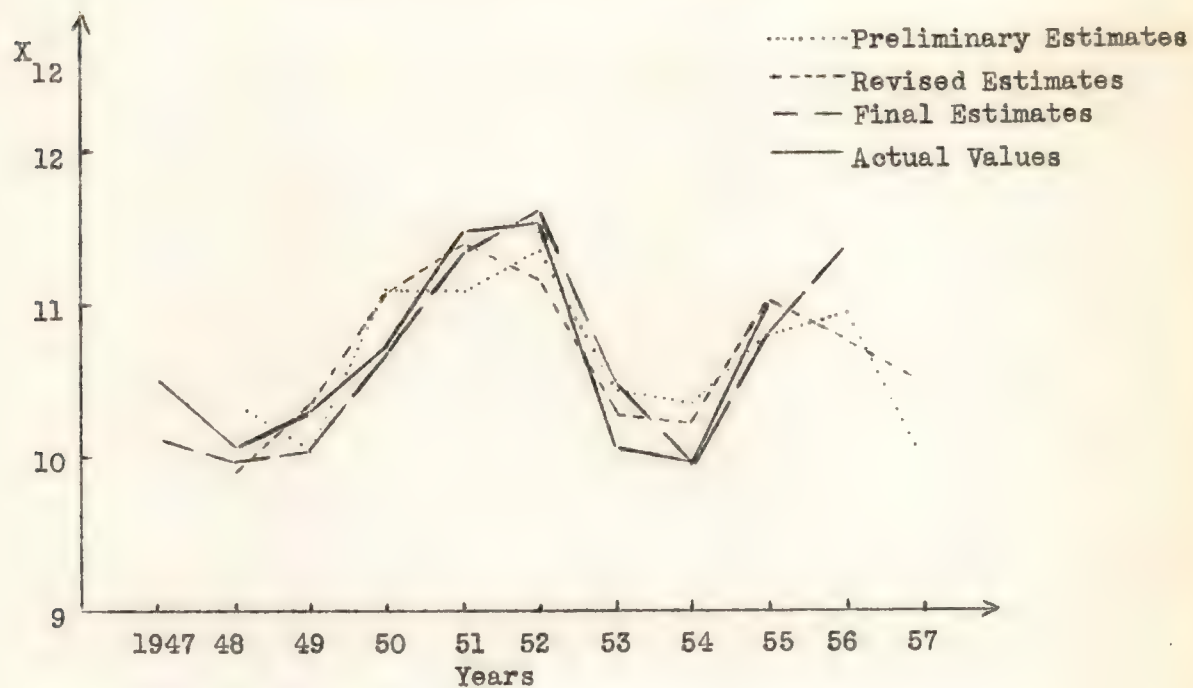
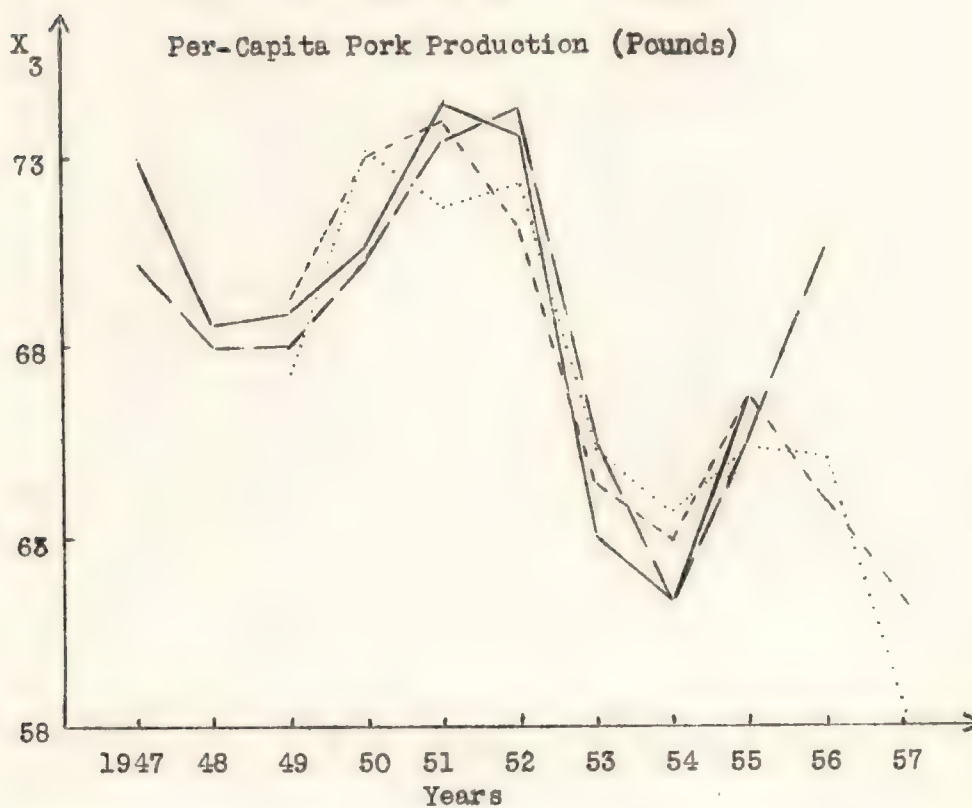
Total Pork Production (10^9 Pounds)

FIGURE 22

Per-Capita Pork Production (Pounds)



PER-DEPTHCORRELATION

PER-DEPTHCORRELATION

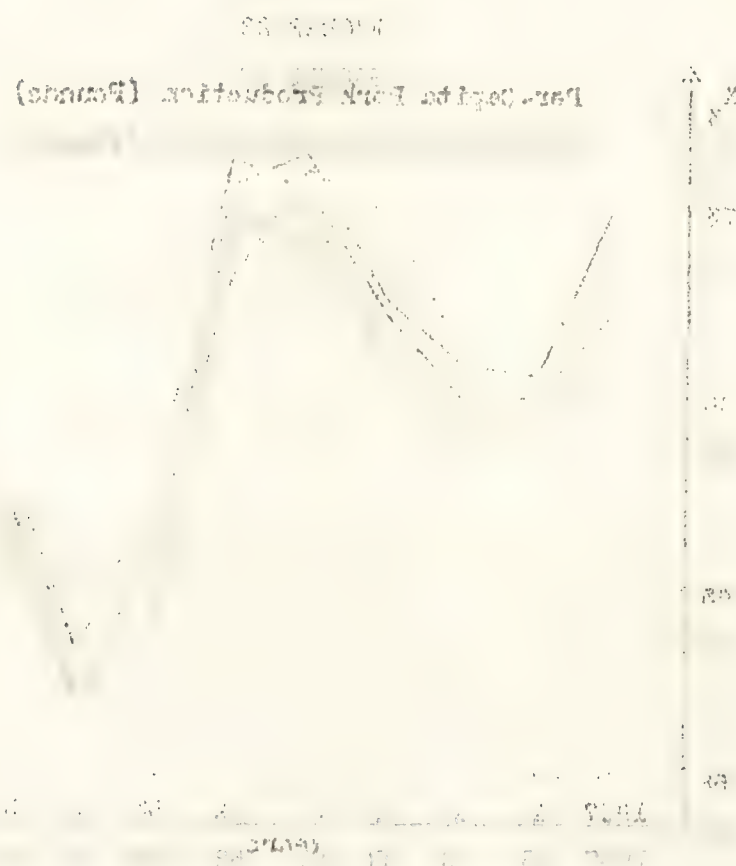
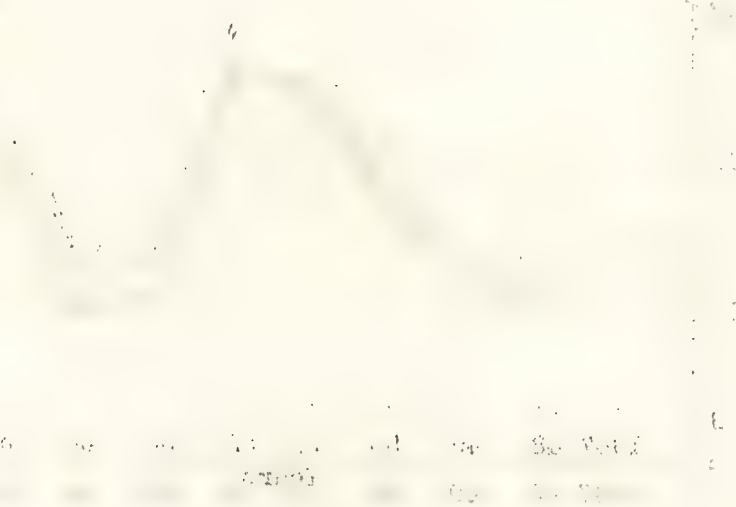


TABLE 5

Data on Disposable Personal Income (Annual Rates)

Year	Revised per-capita disposable income	Preliminary estimate of per-capita disposable income ^{a/}	Preliminary total United States disposable income, second quarter	Final estimate of per-capita disposable income ^{b/}
	1	2	3	4
	dollars		10 ⁹ dollars	dollars
1947	c/		170.0	
1948	1,279	1,279	187.3	1,281
1949	1,261	1,324	194.2	1,304
1950	1,359	1,370	195.5	1,291
1951	1,465	1,418	222.8	1,447
1952	1,508	1,468	231.5	1,478
1953	1,568	1,519	247.7	1,554
1954	1,569	1,572	252.9	1,560
1955	1,628	1,627	267.1	1,620
1956	1,706 ^{d/}	1,684	284.9	1,699
1957		1,743		

^{a/} Use in August for making preliminary estimates. Use in February for making revised estimates. Values are based on 3.5 per cent annual increase with 1948 as a base.

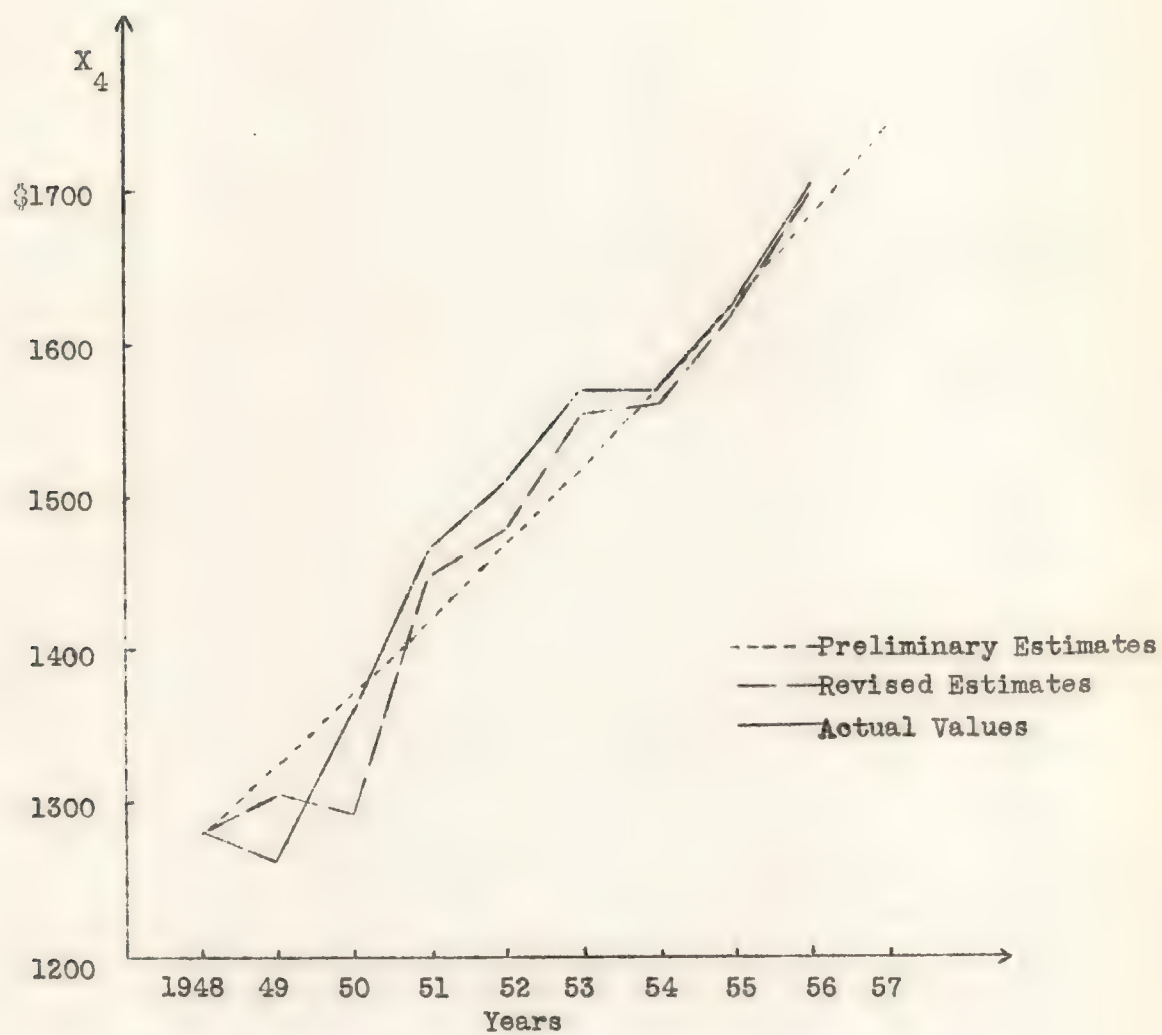
^{b/} Use in making final estimates. Values are equal to column 3, Table 5, divided by column 3, Table 1.

^{c/} Blank spaces indicate no data available or data not relevant to analysis.

^{d/} Preliminary.

FIGURE 23

Per-Capita Annual Disposable Income (United States)



Graph

Graph of a function



Graph of a function
y = f(x)

TABLE 6

Forecasts and Actual Values for X_1 and X_1^* (Omaha)

Year	Actual values		Preliminary estimates		Revised estimates		Final estimates	
	X_1	X_1^*	X_1'	$X_1^{*'} $	X_1'	$X_1^{*'} $	X_1'	$X_1^{*'} $
	1 dollars	2 ratio	3 dollars	4 ratio	5 dollars	6 ratio	7 dollars	8 ratio
1949	32.60	1.330	35.47	1.231	35.37	1.363	33.39	1.299
1950	34.57	1.506	33.32	1.668	34.79	1.638	33.04	1.441
1951	38.66	1.680	34.24	1.588	34.74	1.724	36.97	1.671
1952	36.29	1.719	32.22	1.685	34.77	1.567	36.22	1.758
1953	34.83	1.027	35.33	1.206	35.92	1.138	34.48	1.257
1954	35.76	1.017	33.61	1.156	33.70	1.103	35.35	.959
1955	32.01	1.409	33.56	1.297	31.86	1.416	31.89	1.326
1956	a/		35.10	1.284	34.90	1.215	31.63	1.712
1957			39.94 (37.31)b/	.794 (1.097)b/	38.39 (36.93)c/	1.021 (1.080)c/		

a/ Blank spaces indicate no data available or data not relevant to analysis.

b/ Corrected. See columns 3 and 4, Table 7.

c/ Corrected. See columns 5 and 6, Table 7.

Q. What is the first number in the list?

A. The first number is 1.

Q. What is the second number in the list?

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324
325	326	327	328	329	330	331	332	333
334	335	336	337	338	339	340	341	342
343	344	345	346	347	348	349	350	351
352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369
370	371	372	373	374	375	376	377	378
379	380	381	382	383	384	385	386	387
388	389	390	391	392	393	394	395	396
397	398	399	400	401	402	403	404	405
406	407	408	409	410	411	412	413	414
415	416	417	418	419	420	421	422	423
424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441
442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459
460	461	462	463	464	465	466	467	468
469	470	471	472	473	474	475	476	477
478	479	480	481	482	483	484	485	486
487	488	489	490	491	492	493	494	495
496	497	498	499	500	501	502	503	504
505	506	507	508	509	510	511	512	513
514	515	516	517	518	519	520	521	522
523	524	525	526	527	528	529	530	531
532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549
550	551	552	553	554	555	556	557	558
559	560	561	562	563	564	565	566	567
568	569	570	571	572	573	574	575	576
577	578	579	580	581	582	583	584	585
586	587	588	589	590	591	592	593	594
595	596	597	598	599	600	601	602	603
604	605	606	607	608	609	610	611	612
613	614	615	616	617	618	619	620	621
622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639
640	641	642	643	644	645	646	647	648
649	650	651	652	653	654	655	656	657
658	659	660	661	662	663	664	665	666
667	668	669	670	671	672	673	674	675
676	677	678	679	680	681	682	683	684
685	686	687	688	689	690	691	692	693
694	695	696	697	698	699	700	701	702
703	704	705	706	707	708	709	710	711
712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729
730	731	732	733	734	735	736	737	738
739	740	741	742	743	744	745	746	747
748	749	750	751	752	753	754	755	756
757	758	759	760	761	762	763	764	765
766	767	768	769	770	771	772	773	774
775	776	777	778	779	780	781	782	783
784	785	786	787	788	789	790	791	792
793	794	795	796	797	798	799	800	801
802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819
820	821	822	823	824	825	826	827	828
829	830	831	832	833	834	835	836	837
838	839	840	841	842	843	844	845	846
847	848	849	850	851	852	853	854	855
856	857	858	859	860	861	862	863	864
865	866	867	868	869	870	871	872	873
874	875	876	877	878	879	880	881	882
883	884	885	886	887	888	889	890	891
892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909
910	911	912	913	914	915	916	917	918
919	920	921	922	923	924	925	926	927
928	929	930	931	932	933	934	935	936
937	938	939	940	941	942	943	944	945
946	947	948	949	950	951	952	953	954
955	956	957	958	959	960	961	962	963
964	965	966	967	968	969	970	971	972
973	974	975	976	977	978	979	980	981
982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999
1000	1001	1002	1003	1004	1005	1006	1007	1008
1009	1010	1011	1012	1013	1014	1015	1016	1017
1018	1019	1020	1021	1022	1023	1024	1025	1026
1027	1028	1029	1030	1031	1032	1033	1034	1035
1036	1037	1038	1039	1040	1041	1042	1043	1044
1045	1046	1047	1048	1049	1050	1051	1052	1053
1054	1055	1056	1057	1058	1059	1060	1061	1062
1063	1064	1065	1066	1067	1068	1069	1070	1071
1072	1073	1074	1075	1076	1077	1078	1079	1080
1081	1082	1083	1084	1085	1086	1087	1088	1089
1090	1091	1092	1093	1094	1095	1096	1097	1098
1099	1100	1101	1102	1103	1104	1105	1106	1107
1108	1109	1110	1111	1112	1113	1114	1115	1116
1117	1118	1119	1120	1121	1122	1123	1124	1125
1126	1127	1128	1129	1130	1131	1132	1133	1134
1135	1136	1137	1138	1139	1140	1141	1142	1143
1144	1145	1146	1147	1148	1149	1150	1151	1152
1153	1154	1155	1156	1157	1158	1159	1160	1161
1162	1163	1164	1165	1166	1167	1168	1169	1170
1171	1172	1173	1174	1175	1176	1177	1178	1179
1180	1181	1182	1183	1184	1185	1186	1187	1188
1189	1190	1191	1192	1193	1194	1195	1196	1197
1198	1199	1200	1201	1202	1203	1204	1205	1206
1207	1208	1209	1210	1211	1212	1213	1214	1215
1216	1217	1218	1219	1220	1221	1222	1223	1224
1225	1226	1227	1228	1229	1230	1231	1232	1233
1234	1235	1236	1237	1238	1239	1240	1241	1242
1243	1244	1245	1246	1247	1248	1249	1250	1251
1252	1253	1254	1255	1256	1257	1258	1259	1260
1261	1262	1263	1264	1265	1266	1267	1268	1269
1270	1271	1272	1273	1274	1275	1276	1277	1278
1279	1280	1281	1282	1283	1284	1285	1286	1287
1288	1289	1290	1291	1292	1293	1294	1295	1296
1297	1298	1299	1300	1301	1302	1303	1304	1305
1306	1307	1308	1309	1310	1311	1312	1313	1314
1315	1316	1317	1318	1319	1320	1321	1322	1323
1324	1325	1326	1327	1328	1329	1330	1331	1332
1333	1334	1335	1336	1337	1338	1339	1340	1341
1342	1343	1344	1345	1346	1347	1348	1349	1350
1351	1352	1353	1354	1355	1356	1357	1358	1359
1360	1361	1362	1363	1364	1365	1366	1367	1368
1369	1370	1371	1372	13				

6. Forecasts of P_{BO} and P_{HO}

Preliminary, revised, and final forecasts (1) of P_{BO} and P_{HO} are given in Table 7 and graphically on Figures 24 and 25. These estimates are all based on equations 1 and 2.

Final forecasts (2) of P_{BO} and P_{HO} are found in the last two columns of Table 7 and are presented for visual appraisal on Figures 26 and 27. These results are based on equations 9 and 10.

B. The Los Angeles Market

1. Forecasts of P_{BLA} and P_{HLA}

The preliminary, revised, and final forecasts (1) of P_{BLA} and P_{HLA} are given in Table 8. These estimates are based on the use of equations 11 and 12 which connect the Omaha and Los Angeles markets. Figures 28 and 29 present these results.

Final forecasts (2) of P_{BLA} and P_{HLA} are given in the last two columns of Table 8. They are based on equations 13 and 14 and are presented on Figures 30 and 31.

... ..

[illegible]

any fact and at least one of the (3) attached lists
of enough no instances later not necessary one has 1 added to another
of the 3 instances or listed one between two 17. the

1871-1872

TABLE 7

Forecasts and Actual Values for P_{BO} and P_{HO} (Omaha)

Year	Actual values		Preliminary estimates		Revised estimates		Final estimates (1) <u>a/</u>		Final estimates (2) <u>b/</u>	
	P_{BO}	P_{HO}	P'_{BO}	P'_{HO}	P'_{BO}	P'_{HO}	P'_{BO}	P'_{HO}	P'_{BO}	P'_{HO}
	1	2	3	4	5	6	7	8	9	10
	dollars per hundredweight									
1949	26.14	19.65	28.11	22.84	29.51	21.65	26.43	20.35	26.05	18.98
1950	29.36	19.49	29.27	17.55	31.15	19.02	27.55	19.12	29.63	19.35
1951	35.28	21.00	29.23	18.40	31.34	18.18	33.85	20.26	34.77	19.93
1952	32.59	18.96	26.78	15.89	29.18	18.62	33.17	18.87	32.43	19.08
1953	23.43	22.82	25.84	21.42	25.81	22.68	25.06	19.94	23.16	23.28
1954	23.76	23.37	23.08	19.97	22.70	20.58	23.02	24.00	23.76	23.15
1955	22.96	16.29	23.80	18.35	22.86	16.14	22.30	16.82	23.21	16.74
1956	21.97	15.46	24.91	19.40	24.11	19.84	24.02	14.03	22.19	14.91
1957	<u>c/</u>		24.16 (25.09) <u>d/</u>	30.43 (22.87) <u>d/</u>	25.41 (24.85) <u>e/</u>	24.89 (23.01) <u>e/</u>				

a/ Based on economic relationships for X_1 and X_1^* .b/ Based on monthly average price for the May, June, July period as given by equations 9 and 10.c/ Blank spaces indicate no data available or data not relevant to analysis.d/ The computed value, \$30.43, is considered to be unreasonable even if per-capita pork production should drop to 58.3 pounds in 1957. A maximum rise of about \$8.00 over the current year's price is permitted. This assumes that the movement along the demand schedule for pork is not reversible over time for large contractions in per-capita supply. Using 62.3 pounds of pork production per capita, $P_{HO} = 22.87$ and $P_{BO} = 25.09$ as a revised result.e/ Correction similar to d/. Use 62.3 pounds of pork production per capita. It is probable that the per-capita disposable income for 1957 will not reach the estimated value of \$1,743 and should be corrected. Use \$1,700 on the assumption of no increase over 1956.

FIGURE 24

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Omaha)

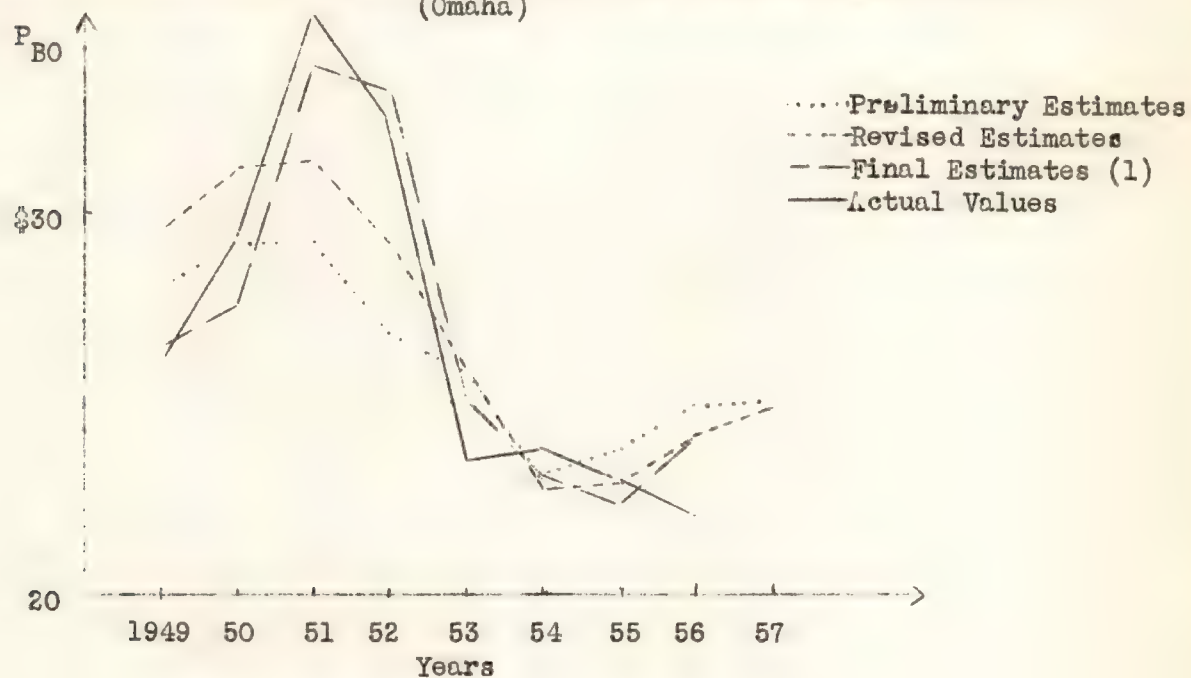


FIGURE 25

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Omaha)

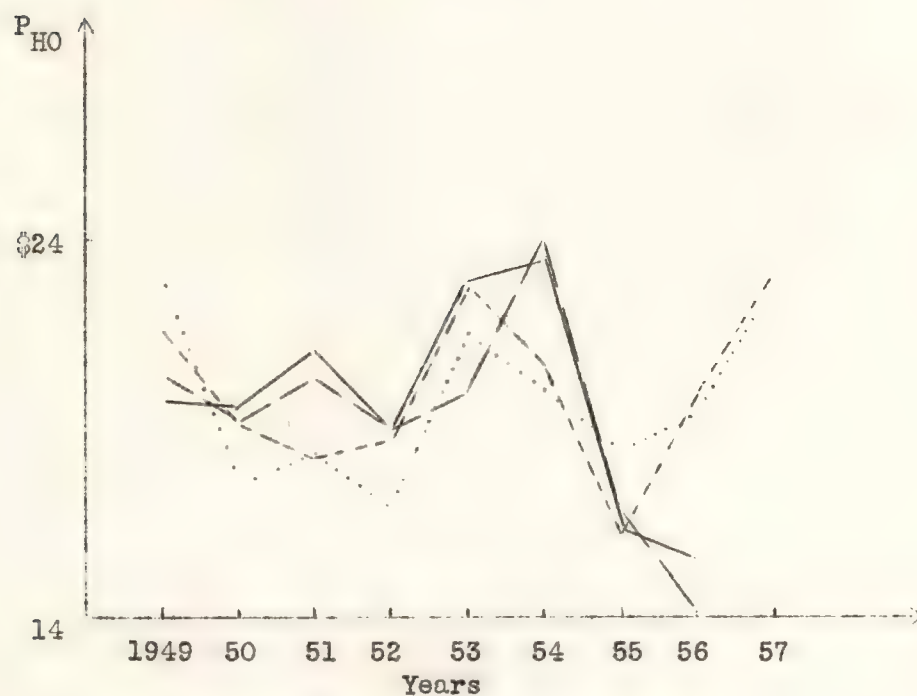


Figure 1

Pressure (atmospheres) vs. Time (minutes) for the reaction of 1,1,1-trichloroethane with chlorine

Reaction conditions:
1,1,1-trichloroethane: 10 ml
Chlorine: 10 ml
Temperature: 25°C



Figure 1

Reaction of 1,1,1-trichloroethane with chlorine at 25°C. The reaction is first order in chlorine.

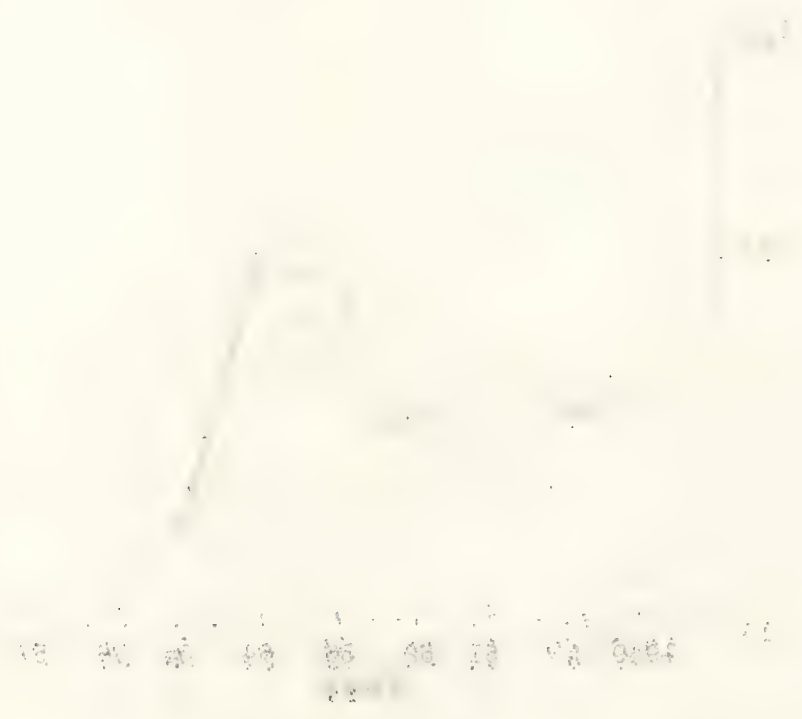


FIGURE 26

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Omaha)

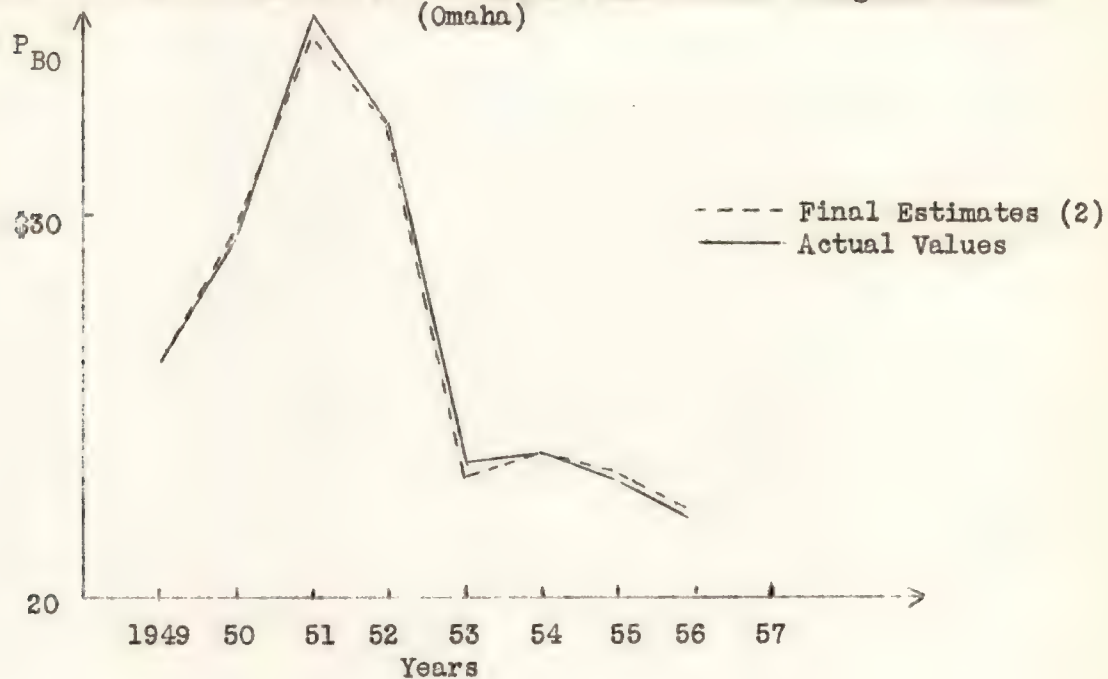
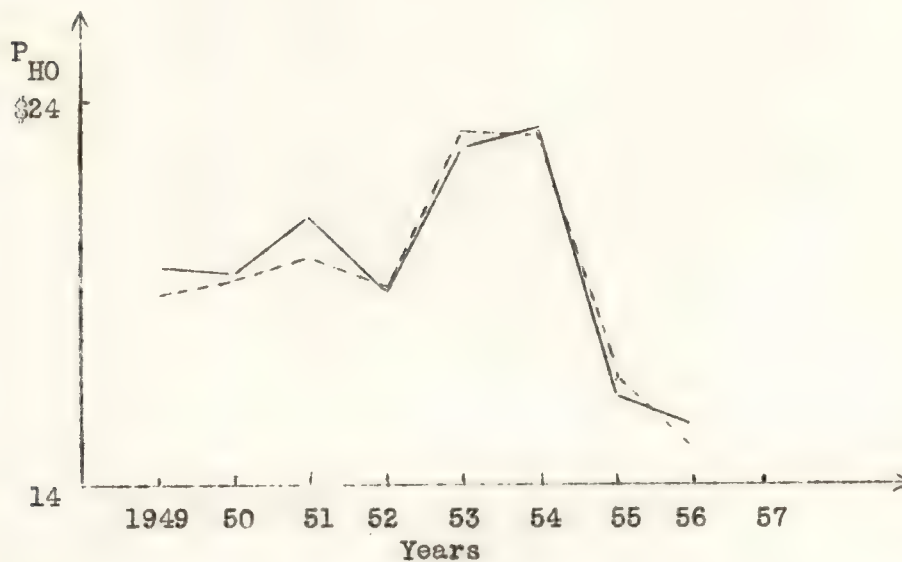


FIGURE 27

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Steers
(Omaha)



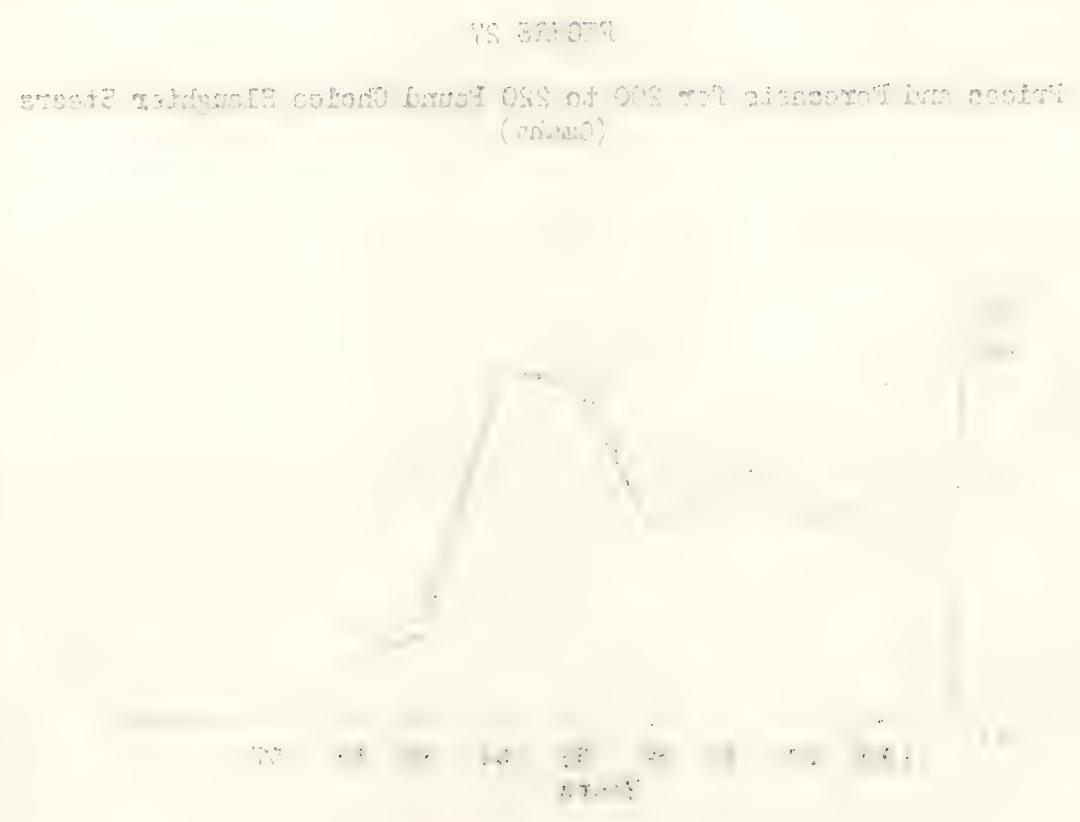


TABLE 8

Forecasts and Actual Values for P_{BLA} and P_{HLA} (Los Angeles)

Year	Actual values		Preliminary estimates ^{a/}		Revised estimates ^{a/}		Final estimates (1) ^{a/}		Final estimates (2) ^{b/}	
	P_{BLA}	P_{HLA}	P'_{BLA}	P'_{HLA}	P'_{BLA}	P'_{HLA}	P'_{BLA}	P'_{HLA}	P'_{BLA}	P'_{HLA}
	1	2	3	4	5	6	7	8	9	10
	dollars per hundredweight									
1949	25.38	21.47	27.96	24.01	29.29	22.95	26.36	21.79	25.37	20.83
1950	29.14	21.27	29.06	19.28	30.85	20.60	27.42	20.69	29.56	21.16
1951	36.30	22.76	29.02	20.04	31.03	19.85	33.42	21.71	35.36	21.70
1952	32.44	20.60	26.69	17.80	28.98	20.24	32.77	20.47	32.08	21.08
1953	23.88	23.93	25.80	22.75	25.77	23.86	25.05	21.42	23.26	24.38
1954	23.83	24.28	23.17	21.45	22.81	22.00	23.11	25.06	24.03	23.92
1955	23.16	17.83	23.86	20.00	22.96	18.02	22.43	18.63	23.36	18.02
1956	21.26	16.76	24.91	20.94	24.15	21.33	24.07	16.13	20.84	16.30
1957	c/		25.08	24.04	24.86	24.17				

^{a/} Based on equations 11 and 12.^{b/} Based on equations 13 and 14.^{c/} Blank spaces indicate no data available or data not relevant to analysis.

7. REPORT OF GRADUATES TO THE STATE

FIGURE 28

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Los Angeles)

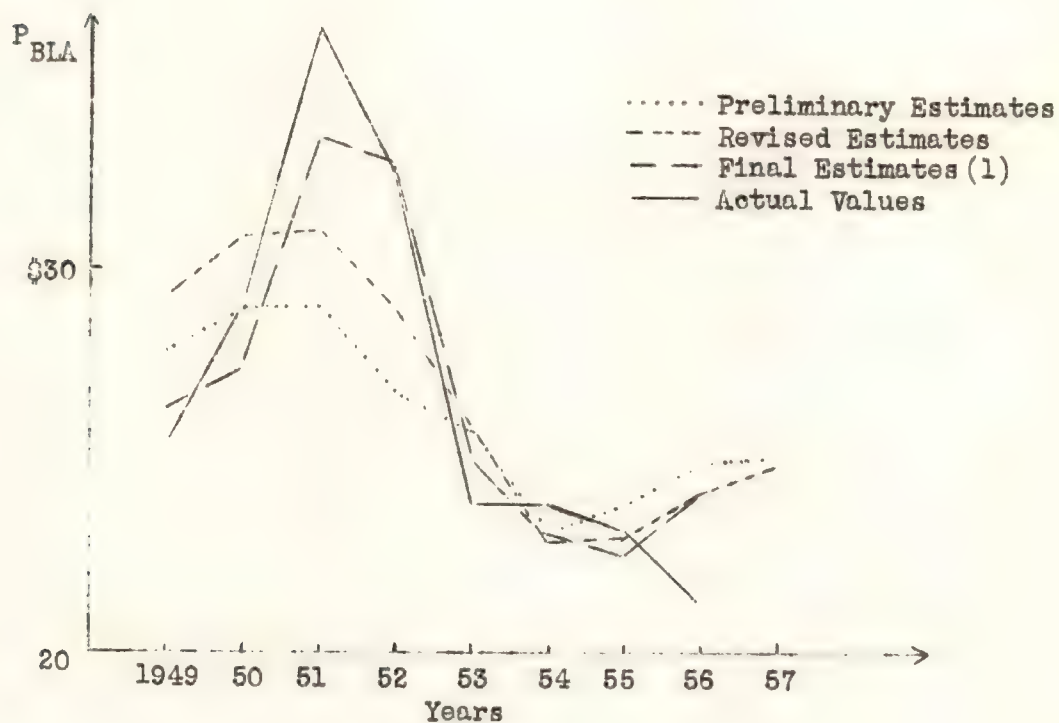
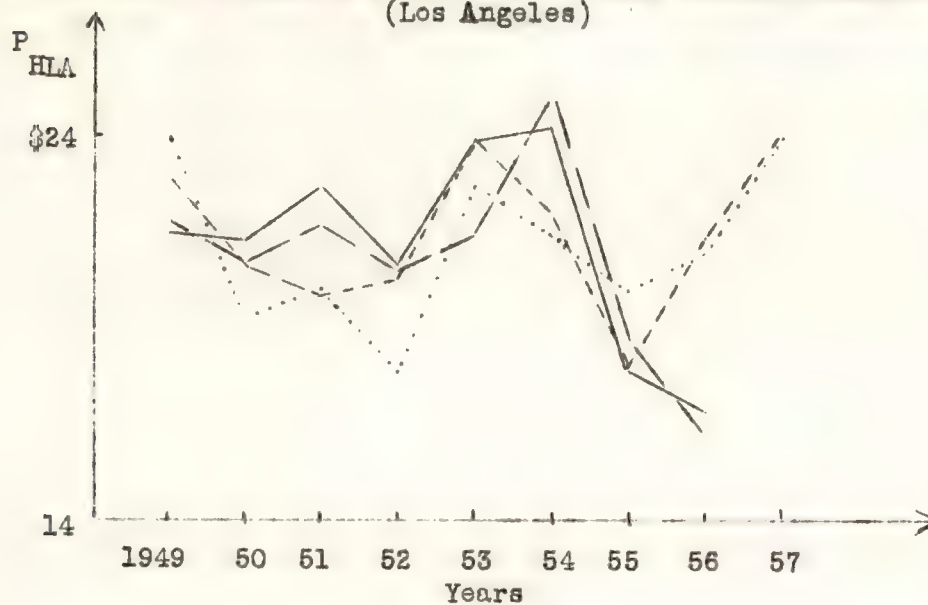


FIGURE 29

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Los Angeles)



1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research.

2. The second part of the report is a detailed description of the methodology used in the study. It includes information about the sample size, the data collection methods, and the statistical analysis techniques.

3. The third part of the report is a discussion of the results of the study. It compares the findings with the previous research and discusses the implications of the study for future research.

4. The fourth part of the report is a conclusion and a list of references. The conclusion summarizes the main findings of the study and the references list the sources of information used in the study.

FIGURE 30

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Los Angeles)

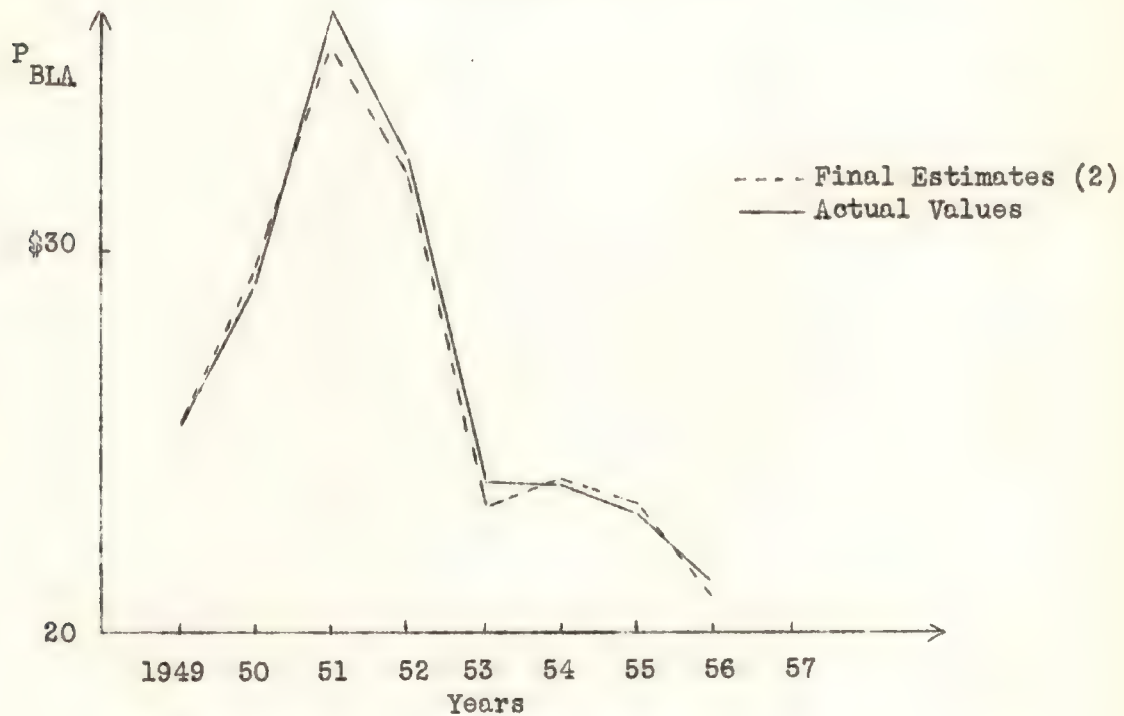
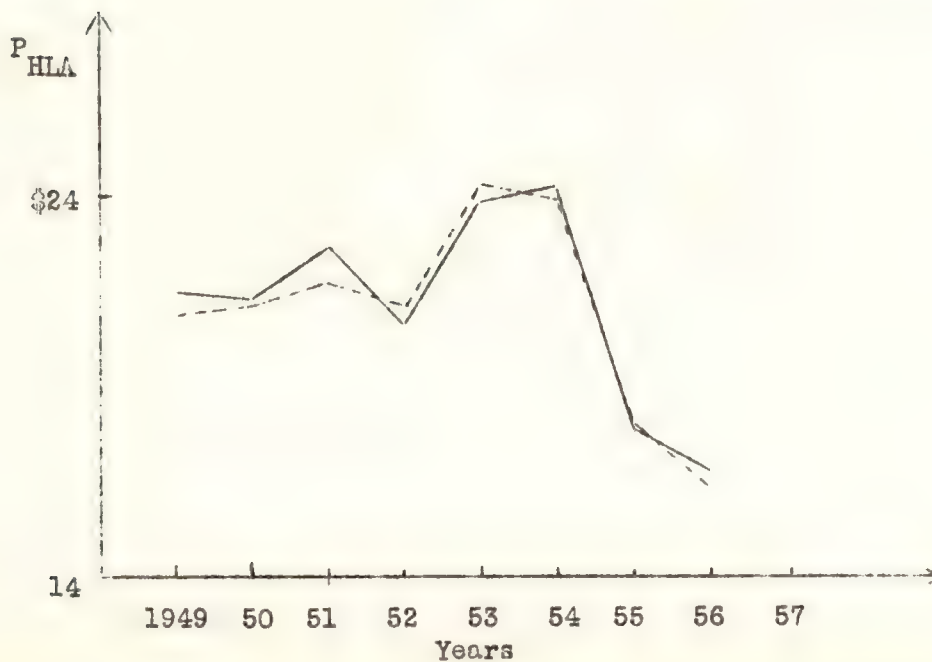


FIGURE 31

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Los Angeles)



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V. The Monthly Forecasts

A. General

Tables 9, 10, 11, and 12 give the monthly average prices at Omaha and Los Angeles for 900 to 1,100 pound choice slaughter steers and 200 to 220 pound choice slaughter hogs. Table 13 contains the computed indexes of seasonal variation for these prices. These indexes are used in the procedure of making monthly forecasts, especially for the January through July period. In later tables whenever one price is computed as being based on another price and no footnote is given for the method, then the method will be understood as employing these indexes in their relative magnitudes.

Tables 7, 10, 11, and 12 give the monthly average prices of grain and
oil for 1940 to 1949. The shaded area in Table 7 shows the
periods of high prices. Table 10 contains the computed means of
seasonal values for four years. These values are used in the
three following monthly forecasts, especially for the winter, spring, and
summer. In each table, however, the price is computed on basis of
another year and is given for the four following years. The
forecasts are given for the four following years.

TABLE 9

Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
dollars per hundredweight													
1949	24.98	22.30	23.94	23.74	24.30	26.03	25.44	26.33	27.96	29.42	29.89	29.32	26.14
1950	28.86	27.44	27.04	27.24	28.66	29.25	29.83	29.54	30.38	30.03	31.30	32.70	29.36
1951	34.84	35.88	35.66	36.36	35.41	34.81	34.74	35.30	36.07	35.16	35.09	34.02	35.28
1952	34.35	34.24	34.14	33.73	33.08	31.82	32.25	32.32	31.80	31.57	31.80	30.02	32.59
1953	27.41	24.49	22.20	21.19	21.73	20.92	23.43	24.07	24.65	24.12	23.66	23.27	23.43
1954	23.51	23.30	23.69	23.90	23.14	22.68	22.28	23.13	24.18	24.20	25.11	25.96	23.76
1955	27.36	26.06	25.65	24.32	22.20	21.82	22.20	21.99	22.49	21.51	20.32	19.55	22.96
1956	20.17	19.67	19.94	20.28	20.26	20.30	22.24	24.80	26.16	25.07	23.36	21.41	21.97
1957	20.94	20.12	21.44										

TABLE 10

Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
dollars per hundredweight													
1949	20.60	20.14	21.61	18.97	19.22	21.18	22.04	21.88	20.87	18.20	15.81	15.29	19.65
1950	16.04	17.27	16.88	16.51	19.36	20.07	24.08	24.66	22.33	19.52	18.13	18.98	19.49
1951	20.70	22.75	21.98	21.30	21.17	22.05	22.04	22.42	20.85	20.42	18.43	17.88	21.00
1952	17.65	17.41	17.46	17.19	20.80	20.38	21.56	22.04	20.27	18.76	16.81	17.21	18.96
1953	18.44	20.18	21.13	22.31	24.16	24.76	26.26	25.07	24.90	21.46	21.01	24.25	22.83
1954	25.88	26.51	26.38	27.61	26.53	25.04	23.22	23.34	20.21	18.94	18.79	17.95	23.37
1955	17.66	17.18	16.76	17.54	17.62	19.94	18.21	16.81	16.50	14.40	12.04	10.78	16.29
1956	11.99	13.00	13.68	15.32	16.50	16.98	16.86	17.25	16.49	15.66	14.88	16.81	15.45
1957	18.27	17.42	17.76										

1981	10/13	11/19	12/18											
1982	11/10	12/17	13/16	14/15	15/14	16/13	17/12	18/11	19/10	20/09	21/08	22/07	23/06	24/05
1983	12/07	13/06	14/05	15/04	16/03	17/02	18/01	19/12	20/11	21/10	22/09	23/08	24/07	25/06
1984	11/04	12/03	13/02	14/01	15/12	16/11	17/10	18/09	19/08	20/07	21/06	22/05	23/04	24/03
1985	10/01	11/00	12/99	13/98	14/97	15/96	16/95	17/94	18/93	19/92	20/91	21/90	22/89	23/88
1986	09/28	10/27	11/26	12/25	13/24	14/23	15/22	16/21	17/20	18/19	19/18	20/17	21/16	22/15
1987	09/14	10/13	11/12	12/11	13/10	14/09	15/08	16/07	17/06	18/05	19/04	20/03	21/02	22/01
1988	08/31	09/30	10/29	11/28	12/27	13/26	14/25	15/24	16/23	17/22	18/21	19/20	20/19	21/18
1989	08/17	09/16	10/15	11/14	12/13	13/12	14/11	15/10	16/09	17/08	18/07	19/06	20/05	21/04
CONTINUED ON NEXT PAGE														
1990	07/24	08/23	09/22	10/21	11/20	12/19	13/18	14/17	15/16	16/15	17/14	18/13	19/12	20/11
1991	07/10	08/09	09/08	10/07	11/06	12/05	13/04	14/03	15/02	16/01	17/00	18/99	19/98	20/97
1992	06/27	07/26	08/25	09/24	10/23	11/22	12/21	13/20	14/19	15/18	16/17	17/16	18/15	19/14
1993	06/13	07/12	08/11	09/10	10/09	11/08	12/07	13/06	14/05	15/04	16/03	17/02	18/01	19/00
1994	05/30	06/29	07/28	08/27	09/26	10/25	11/24	12/23	13/22	14/21	15/20	16/19	17/18	18/17
1995	05/16	06/15	07/14	08/13	09/12	10/11	11/10	12/09	13/08	14/07	15/06	16/05	17/04	18/03
1996	04/23	05/22	06/21	07/20	08/19	09/18	10/17	11/16	12/15	13/14	14/13	15/12	16/11	17/10
1997	04/09	05/08	06/07	07/06	08/05	09/04	10/03	11/02	12/01	13/00	14/99	15/98	16/97	17/96
1998	03/26	04/25	05/24	06/23	07/22	08/21	09/20	10/19	11/18	12/17	13/16	14/15	15/14	16/13
1999	03/12	04/11	05/10	06/09	07/08	08/07	09/06	10/05	11/04	12/03	13/02	14/01	15/00	16/99
2000	02/28	03/27	04/26	05/25	06/24	07/23	08/22	09/21	10/20	11/19	12/18	13/17	14/16	15/15
2001	02/14	03/13	04/12	05/11	06/10	07/09	08/08	09/07	10/06	11/05	12/04	13/03	14/02	15/01
2002	01/31	02/29	03/28	04/27	05/26	06/25	07/24	08/23	09/22	10/21	11/20	12/19	13/18	14/17
2003	01/17	02/16	03/15	04/14	05/13	06/12	07/11	08/10	09/09	10/08	11/07	12/06	13/05	14/04
2004	01/03	02/02	03/01	04/00	05/99	06/98	07/97	08/96	09/95	10/94	11/93	12/92	13/91	14/90
2005	12/20	01/19	02/18	03/17	04/16	05/15	06/14	07/13	08/12	09/11	10/10	11/09	12/08	01/07
2006	12/06	01/05	02/04	03/03	04/02	05/01	06/00	07/99	08/98	09/97	10/96	11/95	12/94	01/93
2007	11/23	12/22	01/21	02/20	03/19	04/18	05/17	06/16	07/15	08/14	09/13	10/12	11/11	12/10
2008	11/09	12/08	01/07	02/06	03/05	04/04	05/03	06/02	07/01	08/00	09/99	10/98	11/97	12/96
2009	10/26	11/25	12/24	01/23	02/22	03/21	04/20	05/19	06/18	07/17	08/16	09/15	10/14	11/13
2010	10/12	11/11	12/10	01/09	02/08	03/07	04/06	05/05	06/04	07/03	08/02	09/01	10/00	11/99
2011	09/29	10/28	11/27	12/26	01/25	02/24	03/23	04/22	05/21	06/20	07/19	08/18	09/17	10/16
2012	09/15	10/14	11/13	12/12	01/11	02/10	03/09	04/08	05/07	06/06	07/05	08/04	09/03	10/02
2013	08/31	09/30	10/29	11/28	12/27	01/26	02/25	03/24	04/23	05/22	06/21	07/20	08/19	09/18
2014	08/17	09/16	10/15	11/14	12/13	01/12	02/11	03/10	04/09	05/08	06/07	07/06	08/05	09/04
2015	07/24	08/23	09/22	10/21	11/20	12/19	01/18	02/17	03/16	04/15	05/14	06/13	07/12	08/11
2016	07/10	08/09	09/08	10/07	11/06	12/05	01/04	02/03	03/02	04/01	05/00	06/99	07/98	08/97
2017	06/27	07/26	08/25	09/24	10/23	11/22	12/21	01/20	02/19	03/18	04/17	05/16	06/15	07/14
2018	06/13	07/12	08/11	09/10	10/09	11/08	12/07	01/06	02/05	03/04	04/03	05/02	06/01	07/00
2019	05/30	06/29	07/28	08/27	09/26	10/25	11/24	12/23	01/22	02/21	03/20	04/19	05/18	06/17
2020	05/16	06/15	07/14	08/13	09/12	10/11	11/10	12/09	01/08	02/07	03/06	04/05	05/04	06/03
2021	04/23	05/22	06/21	07/20	08/19	09/18	10/17	11/16	12/15	01/14	02/13	03/12	04/11	05/10
2022	04/09	05/08	06/07	07/06	08/05	09/04	10/03	11/02	12/01	01/00	02/99	03/98	04/97	05/96
2023	03/26	04/25	05/24	06/23	07/22	08/21	09/20	10/19	11/18	12/17	01/16	02/15	03/14	04/13
2024	03/12	04/11	05/10	06/09	07/08	08/07	09/06	10/05	11/04	12/03	01/02	02/01	03/00	04/99
2025	02/28	03/27	04/26	05/25	06/24	07/23	08/22	09/21	10/20	11/19	12/18	01/17	02/16	03/15
2026	02/14	03/13	04/12	05/11	06/10	07/09	08/08	09/07	10/06	11/05	12/04	01/03	02/02	03/01
2027	01/31	02/29	03/28	04/27	05/26	06/25	07/24	08/23	09/22	10/21	11/20	12/19	01/18	02/17
2028	01/17	02/16	03/15	04/14	05/13	06/12	07/11	08/10	09/09	10/08	11/07	12/06	01/05	02/04
2029	01/03	02/02	03/01	04/00	05/99	06/98	07/97	08/96	09/95	10/94	11/93	12/92	01/91	02/90
2030	12/20	01/19	02/18	03/17	04/16	05/15	06/14	07/13	08/12	09/11	10/10	11/09	12/08	01/07
2031	12/06	01/05	02/04	03/03	04/02	05/01	06/00	07/99	08/98	09/97	10/96	11/95	12/94	01/93
2032	11/23	12/22	01/21	02/20	03/19	04/18	05/17	06/16	07/15	08/14	09/13	10/12	11/11	12/10
2033	11/09	12/08	01/07	02/06	03/05	04/04	05/03	06/02	07/01	08/00	09/99	10/98	11/97	12/96
2034	10/26	11/25	12/24	01/23	02/22	03/21	04/20	05/19	06/18	07/17	08/16	09/15	10/14	11/13
2035	10/12	11/11	12/10	01/09	02/08	03/07	04/06	05/05	06/04	07/03	08/02	09/01	10/00	11/99
2036	09/29	10/28	11/27	12/26	01/25	02/24	03/23	04/22	05/21	06/20	07/19	08/18	09/17	10/16
2037	09/15	10/14	11/13	12/12	01/11	02/10	03/09	04/08	05/07	06/06	07/05	08/04	09/03	10/02
2038	08/31	09/30	10/29	11/28	12/27	01/26	02/25	03/24	04/23	05/22	06/21	07/20	08/19	09/18
2039	08/17	09/16	10/15	11/14	12/13	01/12	02/11	03/10	04/09	05/08	06/07	07/06	08/05	09/04
2040	07/24	08/23	09/22	10/21	11/20	12/19	01/18	02/17	03/16	04/15	05/14	06/13	07/12	08/11
2041	07/10	08/09	09/08	10/07	11/06	12/05	01/04	02/03	03/02	04/01	05/00	06/99	07/98	08/97
2042	06/27	07/26	08/25	09/24	10/23	11/22	12/21	01/20	02/19	03/18	04/17	05/16	06/15	07/14
2043	06/13	07/12	08/11	09/10	10/09	11/08	12/07	01/06	02/05	03/04	04/03	05/02	06/01	07/00
2044	05/30	06/29	07/28	08/27	09/26	10/25	11/24	12/23	01/22	02/21	03/20	04/19	05/18	06/17
2045	05/16	06/15	07/14	08/13	09/12	10/11	11/10	12/09	01/08	02/07	03/06	04/05	05/04	06/03
2046	04/23	05/22	06/21	07/20	08/19	09/18	10/17	11/16	12/15	01/14	02/13	03/12	04/11	05/10
2047	04/09	05/08	06/07	07/06	08/05	09/04	10/03	11/02	12/01	01/00	02/99	03/98	04/97	05/96
2048	03/26	04/25	05/24	06/23	07/22	08/21	09/20	10/19	11/18	12/17	01/16	02/15	03/14	04/13
2049	03/12	04/11	05/10	06/09	07/08	08/07	09/06	10/05	11/04	12/03	01/02	02/01	03/00	04/99
2050	02/28	03/27	04/26	05/25	06/24	07/23	08/22	09/21	10/20	11/19	12/18	01/17	02/16	03/15
2051	02/14	03/13	04/12	05/11	06/10	07/09	08/08	09/07	10/06	11/05	12/04	01/03	02/02	03/01
2052	01/31	02/29	03/28	04/27	05/26	06/25	07/24	08/23	09/22	10/21	11/20	12/19	01/18	02/17
2053	01/17	02/16	03/15	04/14	05/13	06/12	07/11	08/10	09/09	10/08	11/07	12/06	01/05	02/04
2054	01/03	02/02	03/01	04/00	05/99	06/98	07/97	08/96	09/95	10/94	11/93	12/92	01/91	02/90
2055	12/20	01/19	02/18	03/17	04/16	05/15	06/14	07/13	08/12	09/11	10/10	11/09	12/08	01/07
2056	12/06	01/05	02/04	03/03	04/02	05/01	06/00	07/99	08/98	09/97	10/96	11/95	12/94	01/93
2057	11/23	12/22	01/21	02/20	03/19	04/18	05/17	06/16	07/15	08/14	09/13	10/12	11/11	12/10
2058	11/09	12/08	01/07	02/06	03/05	04/04	05/03	06/02	07/01	08/00	09/99	10/98	11/97	12/96
2059	10/26	11/25	12/24	01/23	02/22	03/21	04/20	05/19	06/18	07/17	08/16	09/15	10/14	11/13
2060	10/12	11/11	12											

TABLE 11

Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
dollars per hundredweight													
1949	23.90	21.55	25.39	25.12	25.57	26.35	26.12	25.71	26.24	26.00	26.35	26.21	25.38
1950	25.88	25.96	26.69	26.98	29.49	30.52	30.41	30.29	30.24	30.35	30.54	32.34	29.14
1951	34.25	35.94	36.46	36.50	36.21	36.24	35.82	35.90	36.84	37.15	37.52	36.74	36.30
1952	35.37	34.60	33.84	33.11	32.56	32.68	32.93	33.25	32.83	30.50	29.92	27.65	32.44
1953	25.77	24.33	23.81	22.57	24.08	23.44	23.50	24.09	23.53	23.08	24.19	24.22	23.88
1954	24.16	23.13	23.12	23.92	24.83	24.40	24.16	24.04	24.15	23.73	22.88	23.43	23.83
1955	24.38	23.90	24.00	24.38	24.08	23.73	23.50	23.47	22.90	22.38	21.09	20.16	23.16
1956	19.90	18.94	20.31	20.44	20.50	21.31	21.72	23.55	24.06	22.95	20.69	20.69	21.26
1957	20.25	20.05	22.14										

TABLE 12

Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
dollars per hundredweight													
1949	23.20	22.72	22.99	21.32	21.37	22.34	23.78	23.35	22.69	20.01	17.26	16.64	21.47
1950	17.50	19.18	18.72	18.53	21.20	21.90	25.37	26.10	24.20	21.68	20.17	20.66	21.27
1951	22.53	24.42	23.78	23.54	22.75	23.48	23.82	24.23	22.71	22.17	20.06	19.61	22.76
1952	19.50	18.96	18.89	18.75	21.87	22.42	23.92	23.98	21.19	20.62	18.60	18.48	20.60
1953	19.72	22.20	22.62	23.42	25.35	25.81	26.73	25.86	25.79	23.20	21.78	24.64	23.93
1954	26.36	26.65	27.44	28.40	27.31	25.82	23.40	23.75	21.65	20.56	20.38	19.58	24.28
1955	19.44	18.96	18.20	18.84	18.78	20.70	19.81	17.85	17.85	16.74	14.30	12.50	17.78
1956	12.95	13.81	14.68	16.50	17.58	18.66	18.00	18.36	17.99	17.46	16.47	18.60	16.76
1957	19.90	19.78	19.22										

1921	10.00	58.10	58.15										
1922	10.22	57.27	57.25	57.20	57.20	57.20	57.20	57.20	57.20	57.20	57.20	57.20	57.20
1923	10.07	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1924	10.30	56.02	55.79	55.70	55.37	55.08	55.70	55.32	55.00	54.70	54.40	54.10	53.80
1925	10.38	55.50	55.55	55.75	55.32	55.03	55.32	55.00	54.70	54.40	54.10	53.80	53.50
1926	10.20	56.01	56.03	56.12	56.05	55.75	55.00	55.00	54.70	54.40	54.10	53.80	53.50
1927	10.01	56.70	56.24	56.09	56.11	56.04	56.00	56.00	56.00	56.00	56.00	56.00	56.00
1928	11.20	57.10	57.00	56.93	56.90	56.90	56.90	56.90	56.90	56.90	56.90	56.90	56.90
1929	10.10	57.20	57.00	56.90	56.90	56.90	56.90	56.90	56.90	56.90	56.90	56.90	56.90
1930	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1931	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1932	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1933	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1934	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1935	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1936	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1937	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1938	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1939	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10
1940	10.00	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10	57.10

Nonprofit: values for 500 to 550 based on price of 500 per unit

TABLE 13

Seasonal Indexes of Prices for Omaha and Los Angeles on 900 to 1,100 Pound Choice Slaughter Steers
and 200 to 220 Pound Choice Slaughter Hogs (Based on Monthly Average Prices, 1949-1955)

	January	February	March	April	May	June	July	August	September	October	November	December
<u>Omaha:</u>												
900 to 1,100 pound choice steers	103	100	99	98	97	95	98	100	102	102	103	103
200 to 220 pound choice hogs	93	98	97	99	105	109	111	112	104	95	88	89
<u>Los Angeles:</u>												
900 to 1,100 pound choice steers	99	98	98	99	101	101	101	101	102	100	100	100
200 to 220 pound choice hogs	94	98	98	100	104	107	110	109	106	97	89	88

B. Omaha Market

1. January Through July Period

Table 14 and Figure 32 give the preliminary and revised forecasts of the cattle prices. Table 16 and Figure 34 give comparable results for the hog prices, excluding the revised forecasts. In all cases the forecasts are computed as two straight line sequences--January through April and April through July. Consequently, the primary points are January, April, and July. Forecasts for January and April are based on the relative indexes with respect to December. The December base is either a final forecast from the previous year or the actual average price for the first week. Forecasts for July are based equally on the December level and the preliminary forecast for the annual average level.

Final forecasts (February through July) and revised final forecasts (May through July) are given in Tables 15 and 17 and Figures 33 and 35 for cattle and hogs. The essential changes in making the final forecasts are (1) the actual price in January is used in lieu of December forecasts, (2) the April forecast is based equally on the January level and the linear trend through January and February to April, and (3) the July forecast is based equally on the January price and the revised forecast for the annual average level. Revised final forecasts for May through July are merely adjustments for one half the error of the forecast for April.

TABLE 14

Preliminary and Revised Forecasts of January-July Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	P_{BO}^a	p_{12}^b	p_1 based on p_{12}	p_4 based on p_{12}	p_7 based on p_{12}	p_7 based on P_{BO}	P_7 average	p_1^c	p_2^c	p_3^c	p_4^c	p_5^c	p_6^c	p_7^c
dollars														
1950	29.27	30.80	30.80	29.26	29.26	28.68	28.97	30.80	30.29	29.77	29.26	29.16	29.06	28.97
	29.27	29.95	29.95	28.45	28.45	28.68	28.56	29.95	29.45	28.95	28.45	28.49	28.52	28.56
1951	29.23	33.20	33.20	31.54	31.54	28.65	30.10	33.20	32.64	32.09	31.54	31.06	30.58	30.10
	29.23	32.88	32.88	31.24	31.24	28.65	29.94	32.88	32.33	31.79	31.24	30.81	30.37	29.94
1952	26.78	32.86	32.86	31.22	31.22	26.24	28.73	32.86	32.31	31.77	31.22	30.39	29.56	28.73
	26.78	34.88	34.88	33.14	33.14	26.24	29.69	34.88	34.30	33.72	33.14	31.99	30.84	29.69
1953	25.84	30.00	30.00	28.50	28.50	25.32	26.91	30.00	29.50	29.00	28.50	27.97	27.44	26.91
	25.84	30.85	30.85	29.31	29.31	25.32	27.32	30.85	30.34	29.82	29.31	28.65	27.98	27.32
1954	23.08	22.89	22.89	21.75	21.75	22.62	22.18	22.89	22.51	22.13	21.75	21.89	22.04	22.18
	23.08	23.60	23.60	22.42	22.42	22.62	22.52	23.60	23.20	22.81	22.42	22.45	22.49	22.52
1955	23.80	25.94	25.94	24.64	24.64	23.32	23.98	25.94	25.51	25.07	24.64	26.42	24.20	23.98
	23.80	25.60	25.60	24.32	24.32	23.32	23.82	25.60	25.17	24.75	24.32	24.15	23.99	23.82
1956	24.91	21.14	21.14	20.08	20.08	24.41	22.24	21.14	21.03	20.91	20.80	21.28	21.76	22.24
	24.91	20.32	20.32	19.30	19.30	24.41	21.86	20.32	19.98	19.64	19.30	20.15	21.01	21.86
1957	25.09	25.16	25.16	23.90	23.90	24.59	24.25	25.16	24.74	24.32	23.90	24.02	24.13	24.25
	25.09	21.80	21.80	20.71	20.71	24.59	22.65	21.80	21.44	21.07	20.71	21.36	22.00	22.65

a/ Preliminary estimates made in August of preceding year.

b/ Final estimates of p_{12} for previous year (upper). Actual prices for first week of December (lower).

c/ Upper values are preliminary estimates made in August of preceding year. Lower values are revised estimates made in December of preceding year.

FIGURE 32

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (January-July)

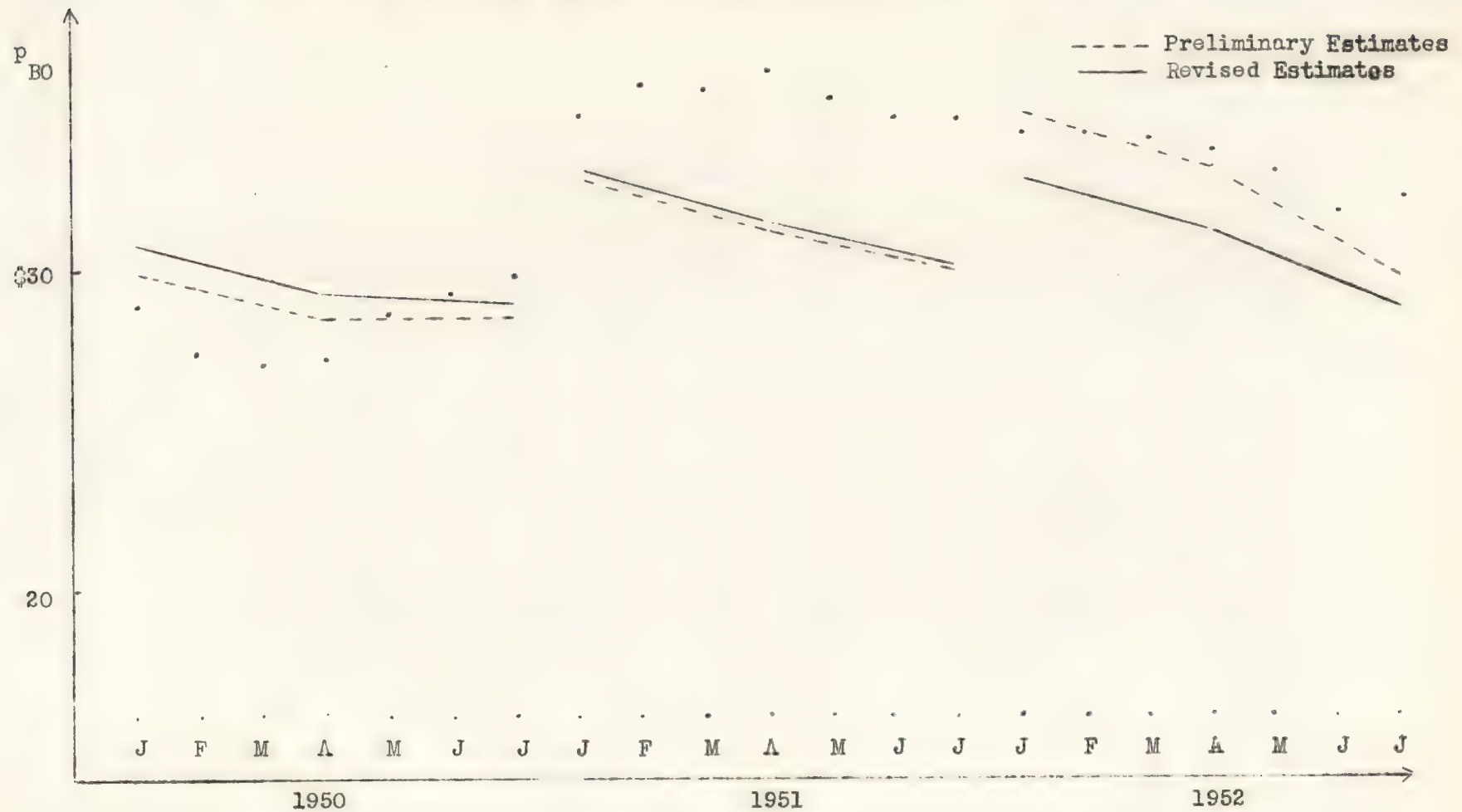
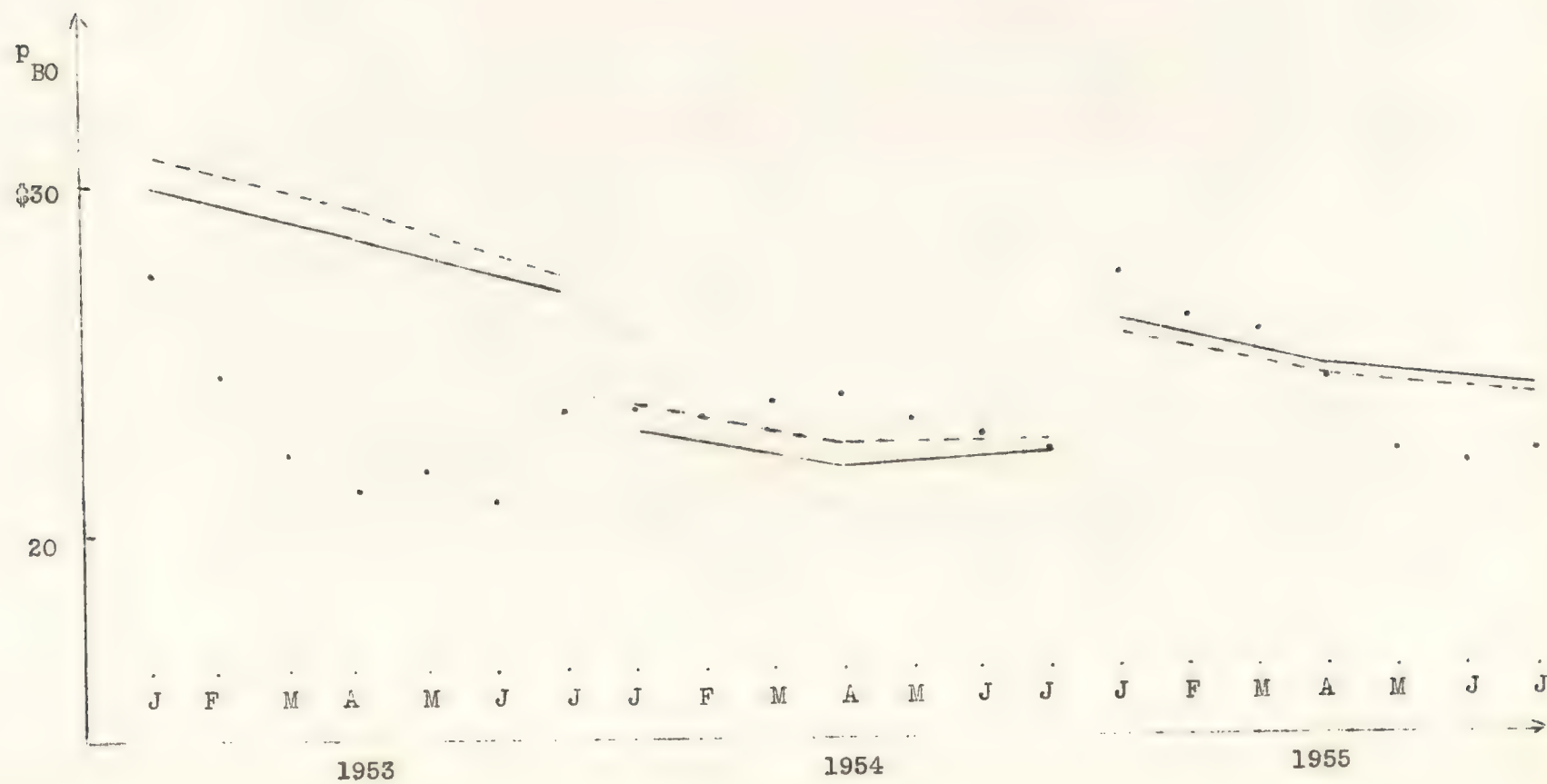
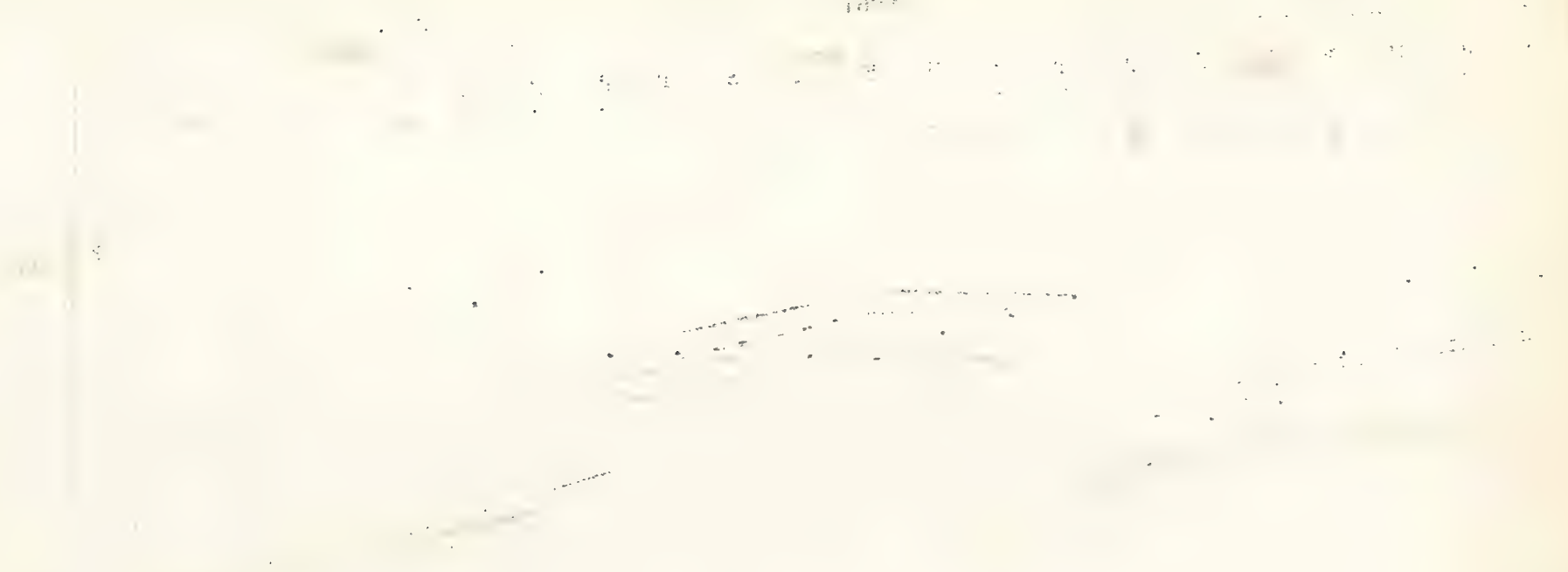


FIGURE 32 Continued



1917

1918



1919

1920

FIGURE 32 Continued

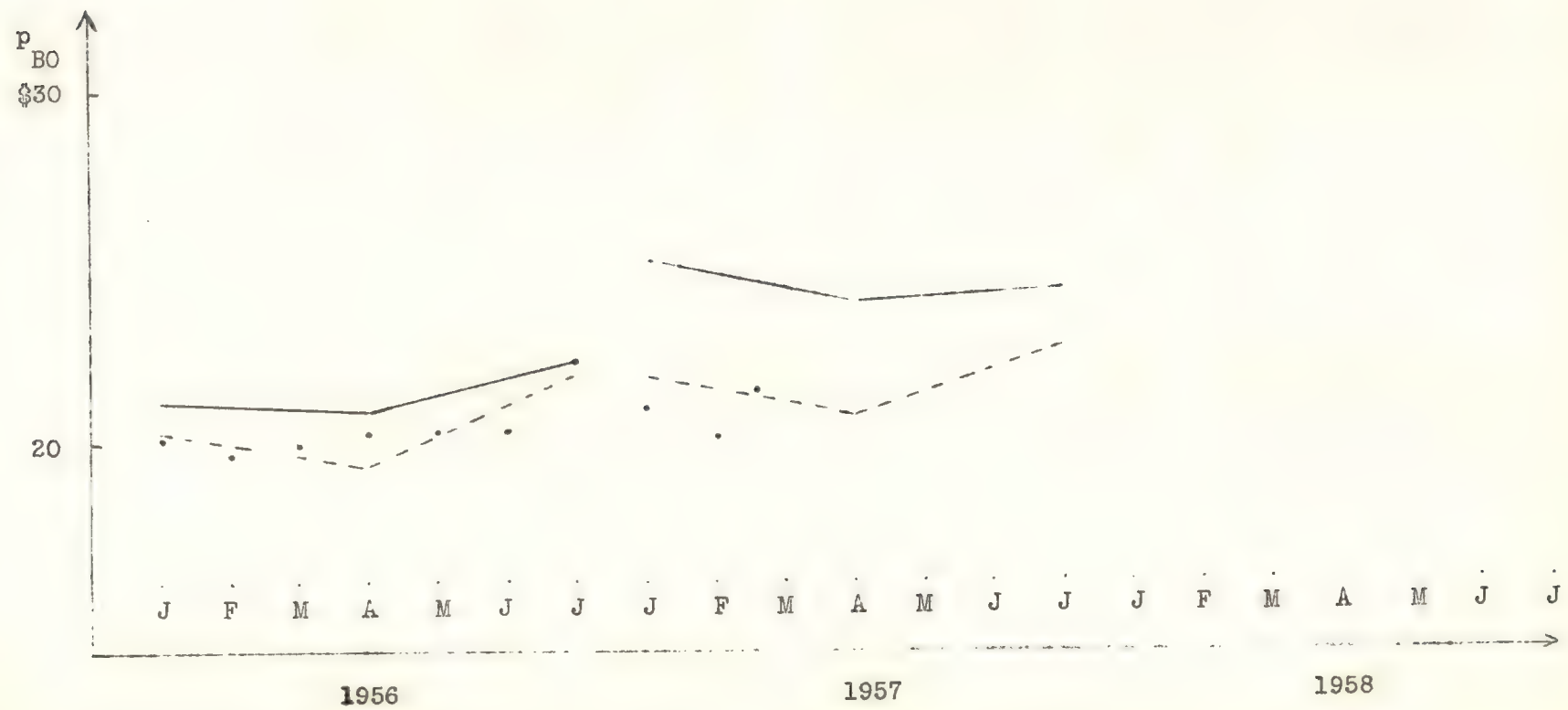


TABLE 15

Final and Revised Final Forecasts of January-July Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	$P'_{BO} \text{ a/}$	p_1	$p'_2 \text{ b/}$	p_4 based on p_1	p_4 based on p_1 and $p'_2 \text{ c/}$	p_4 average	p_7 based on p_1	p_7 based on P'_{BO}	p_7 average	p_3	$p_4 \text{ d/}$	$p_5 \text{ d/}$	$p_6 \text{ d/}$	$p_7 \text{ d/}$
	dollars													
1949	29.51	24.98	22.28	23.73	16.88	20.30	23.73	28.92	26.32	21.29	20.30	22.31	24.31	26.32
1950	31.15	28.86	27.72	27.42	25.44	26.43	27.42	30.53	28.98	27.08	22.02	24.03	26.03	28.04
1951	31.34	34.84	35.88	33.10	37.96	35.53	33.10	30.71	31.90	35.60	26.43	27.28	28.13	28.98
1952	29.18	34.35	34.38	32.63	34.44	33.54	32.63	28.60	30.62	33.96	26.84	27.69	28.54	29.39
1953	25.81	27.41	25.45	26.04	21.53	23.78	26.04	25.29	25.66	24.62	35.33	34.19	33.04	31.90
1954	22.70	23.51	23.02	22.33	22.04	22.18	22.33	22.25	22.29	22.60	35.84	34.70	33.55	32.41
1955	22.86	27.36	26.90	25.99	25.98	25.98	25.99	22.40	24.20	26.44	33.54	32.57	31.59	30.62
1956	24.11	20.17	19.85	19.16	19.21	19.18	19.16	23.63	21.40	19.52	33.64	32.67	31.69	30.72
1957	24.85	20.94	20.20	19.89	18.70	19.30	19.89	24.35	22.12	19.85	23.78	24.41	25.03	25.66
											22.48	23.11	23.73	24.36
											22.18	22.22	22.25	22.29
											23.04	23.08	23.11	23.15
											25.98	25.39	24.79	24.20
											25.15	24.56	23.96	23.37
											19.18	19.92	20.66	21.40
											19.73	20.47	21.21	21.95
											19.30	20.24	21.18	22.12

a/ Revised estimates made in February.

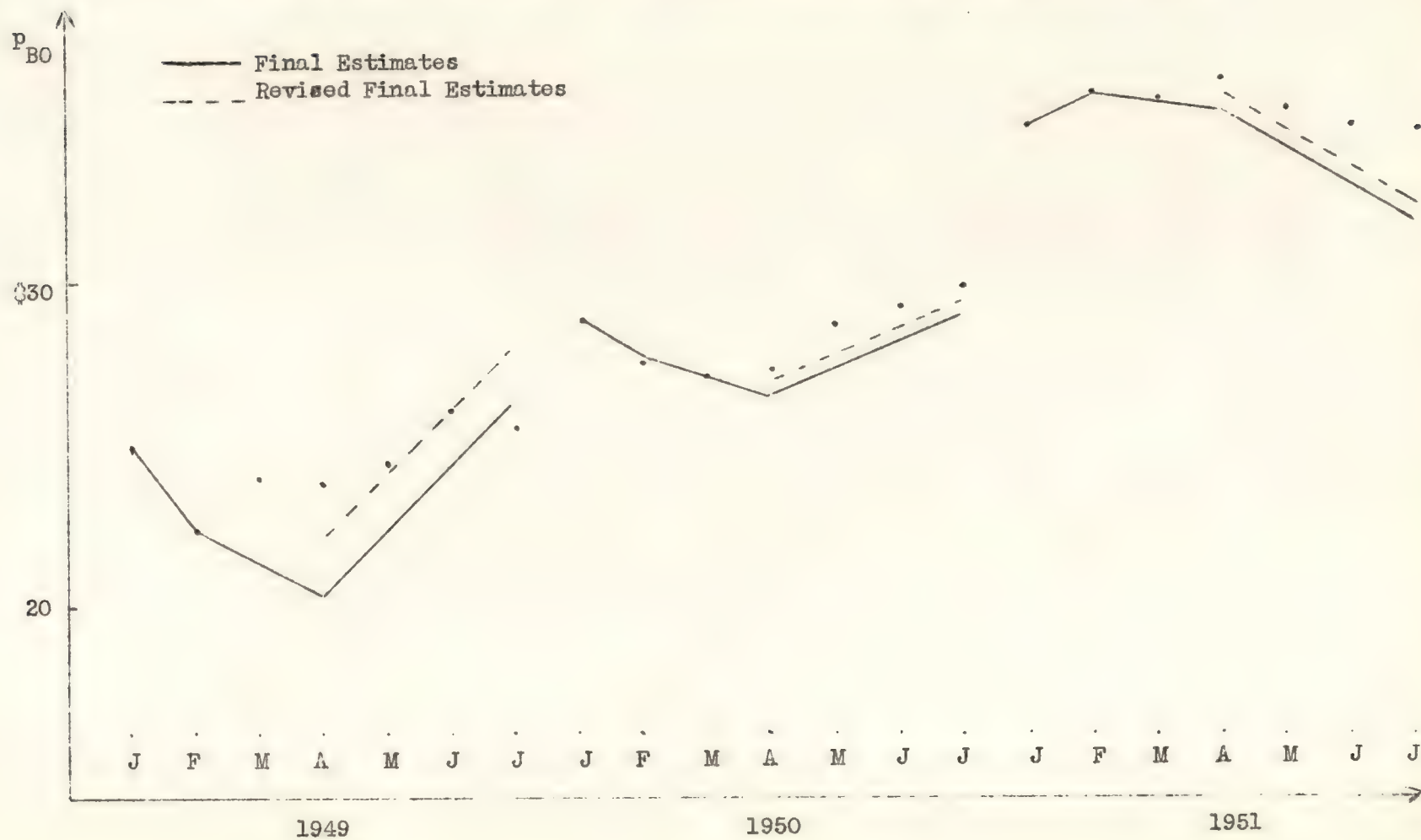
b/ Actual prices for first week of February; also taken as p_2 .

c/ $p_4 = p_1 - 3(p_1 - p'_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. The value for April is taken as the average of the predicted and actual price. May, June, and July are extended parallel to the previous estimates.

FIGURE 33

Final and Revised Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (January-July)



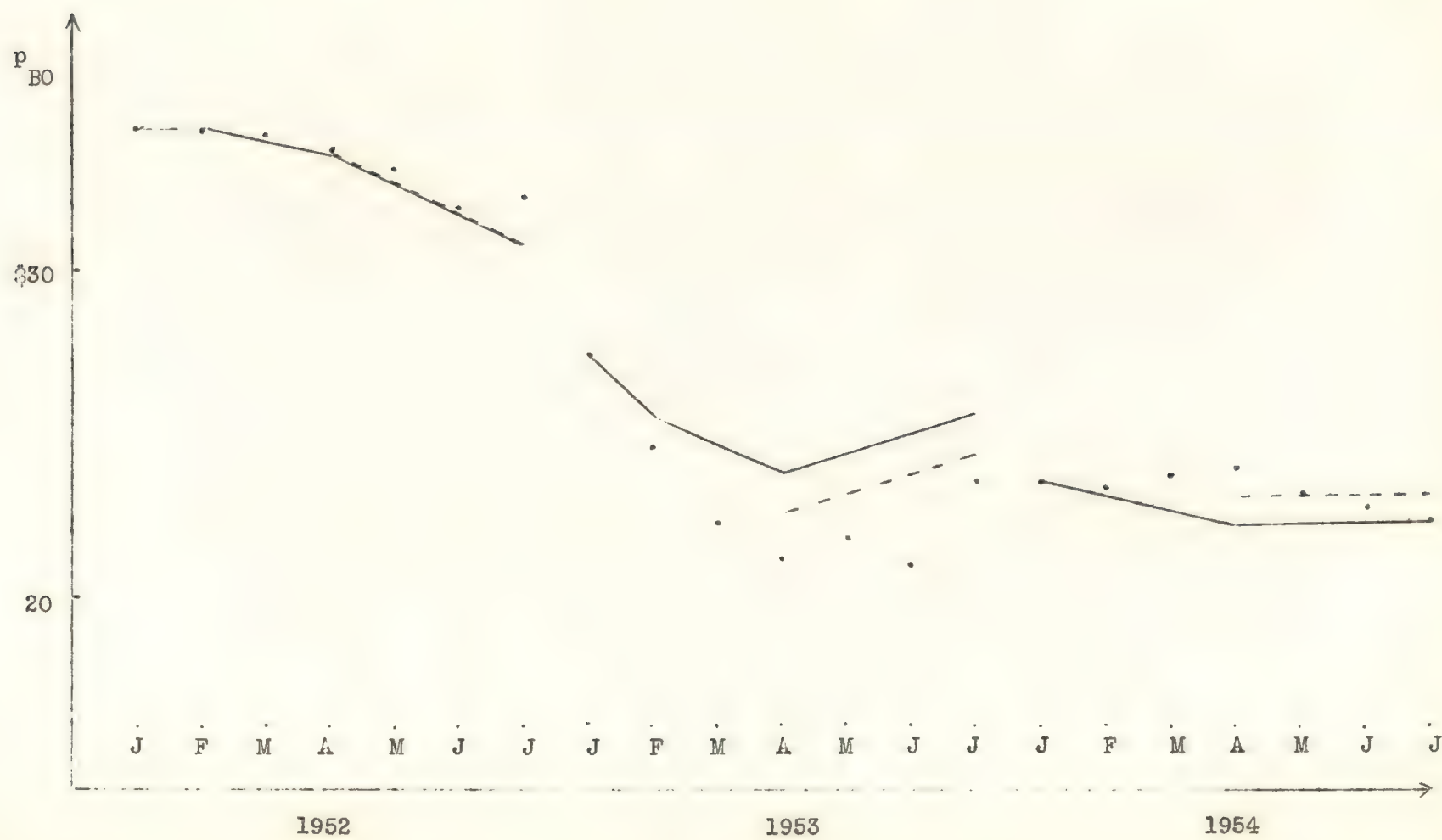
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FIGURE 33 Continued



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FIGURE 1

FIGURE 33 Continued

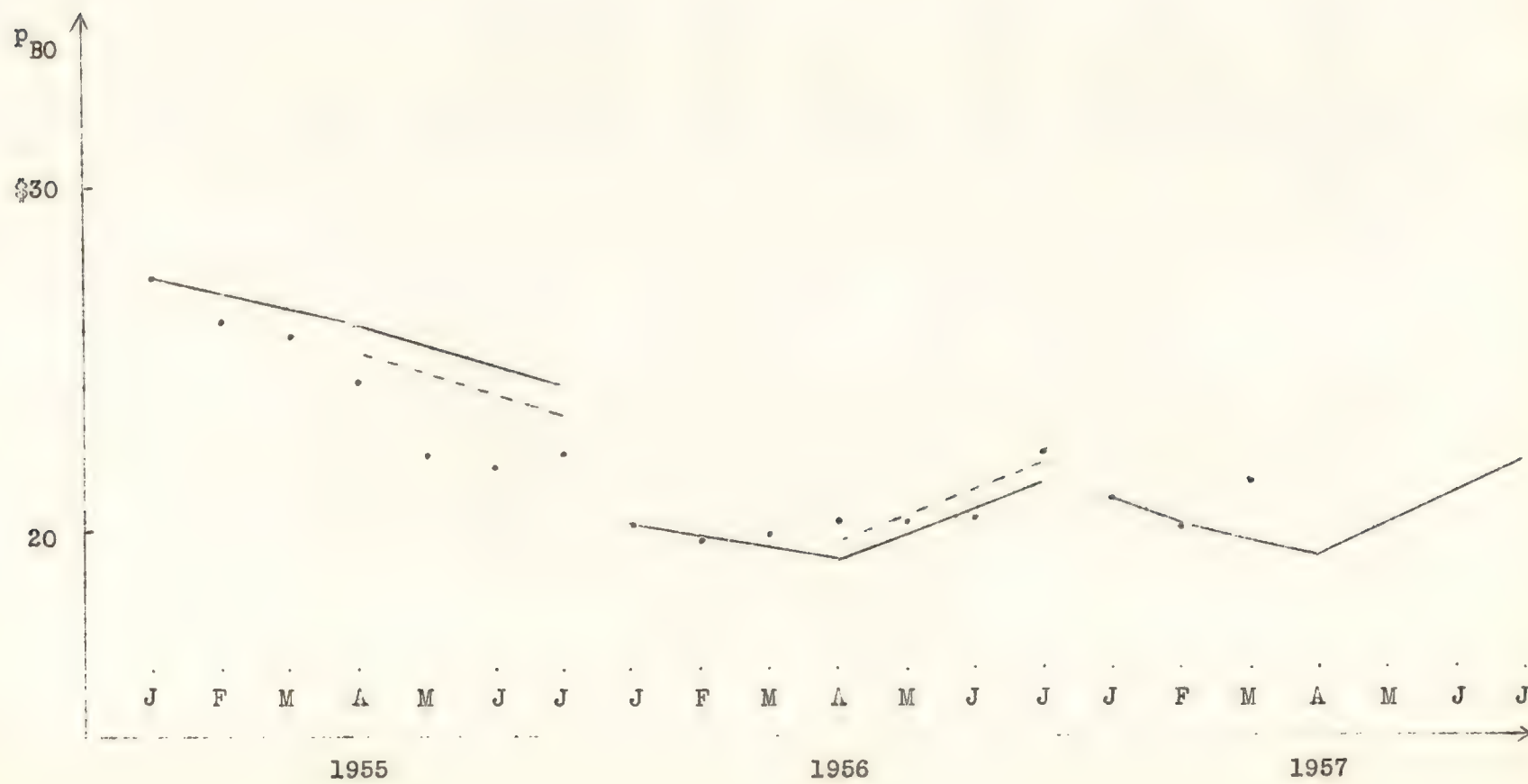


TABLE 16

Preliminary Forecasts of January-July Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	P_{HO}^a	P_{12}^b	P_1 based on P_{12}	P_4 based on P_{12}	P_7 based on P_{12}	P_7 based on P_{HO}^a	P_7 average	P_1	P_2	P_3	P_4	P_5	P_6	P_7
dollars														
1950	17.55	16.24	16.89	18.03	20.30	19.48	19.89	16.89	17.27	17.65	18.03	18.65	19.27	19.89
1951	18.40	18.72	19.47	20.78	23.40	20.42	21.91	19.47	19.91	20.34	20.78	21.16	21.53	21.91
1952	15.89	17.37	18.05	19.28	21.71	17.64	19.68	18.05	18.46	18.87	19.28	19.41	19.55	19.68
1953	21.42	17.42	18.12	19.34	21.78	23.78	22.78	18.12	18.53	18.93	19.34	20.49	21.63	22.78
1954	19.97	20.71	21.54	22.99	25.89	22.17	24.03	21.54	22.02	22.51	22.99	23.34	23.68	24.03
1955	18.35	16.74	17.41	18.58	20.92	20.37	20.64	17.41	17.80	18.19	18.58	19.27	19.95	20.64
1956	19.40	13.68	14.23	15.18	17.10	21.53	19.32	14.23	14.55	14.86	15.18	16.56	17.94	19.32
1957	22.87	13.55	14.08	15.04	16.94	25.39	21.16	14.08	14.40	14.72	15.04	17.03	19.12	21.16

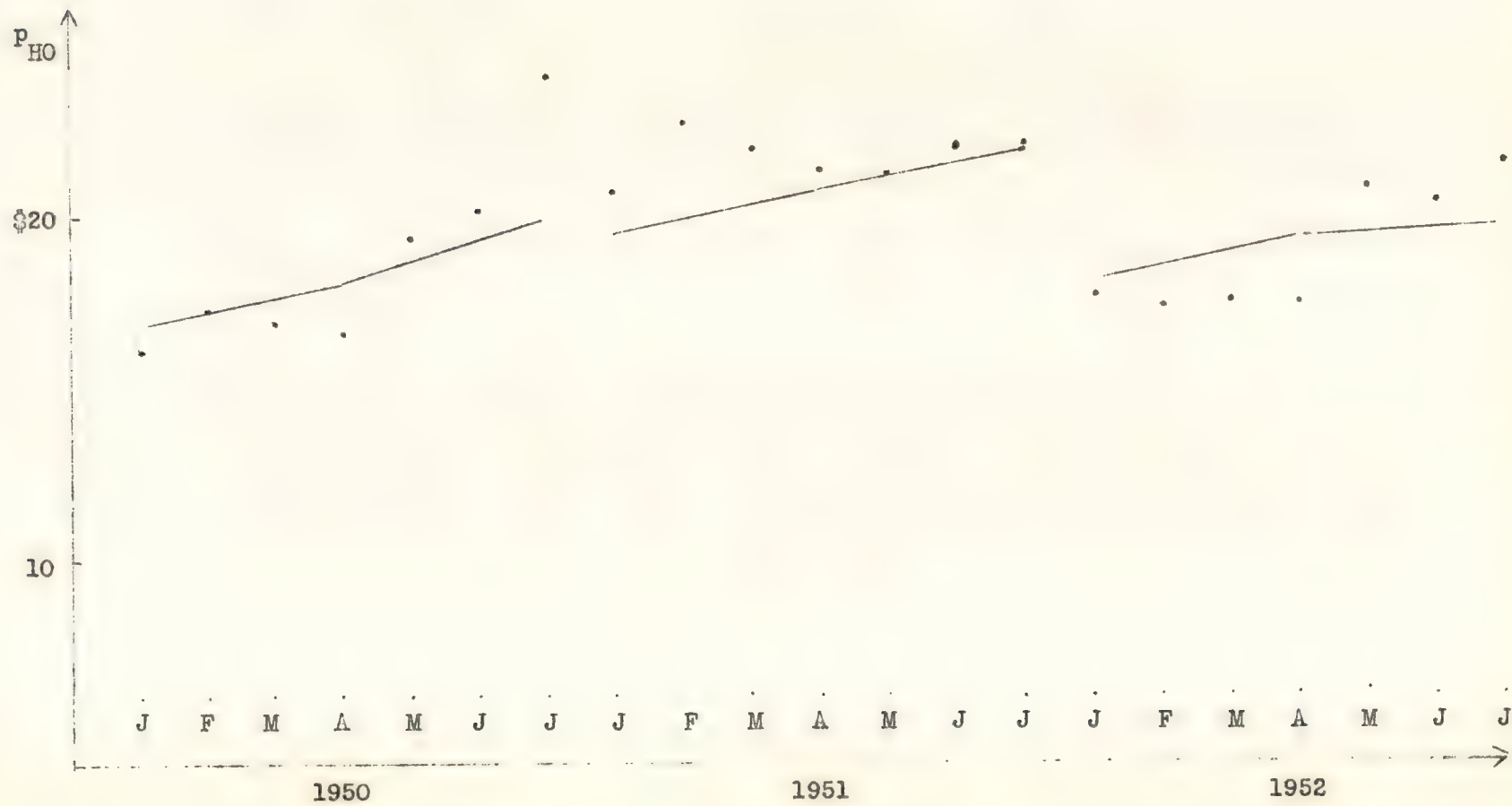
a/ Preliminary estimates made in August of preceding year.

b/ Final estimates for P_{12} for previous year.

By 1900, the population of the city was 15,000.

FIGURE 34

Preliminary Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (January-July)



THE 100 TO 1000 YEARS OLD (1000-1000) (1000-1000)

THE 100 TO 1000 YEARS OLD (1000-1000) (1000-1000)

FIGURE 34 Continued

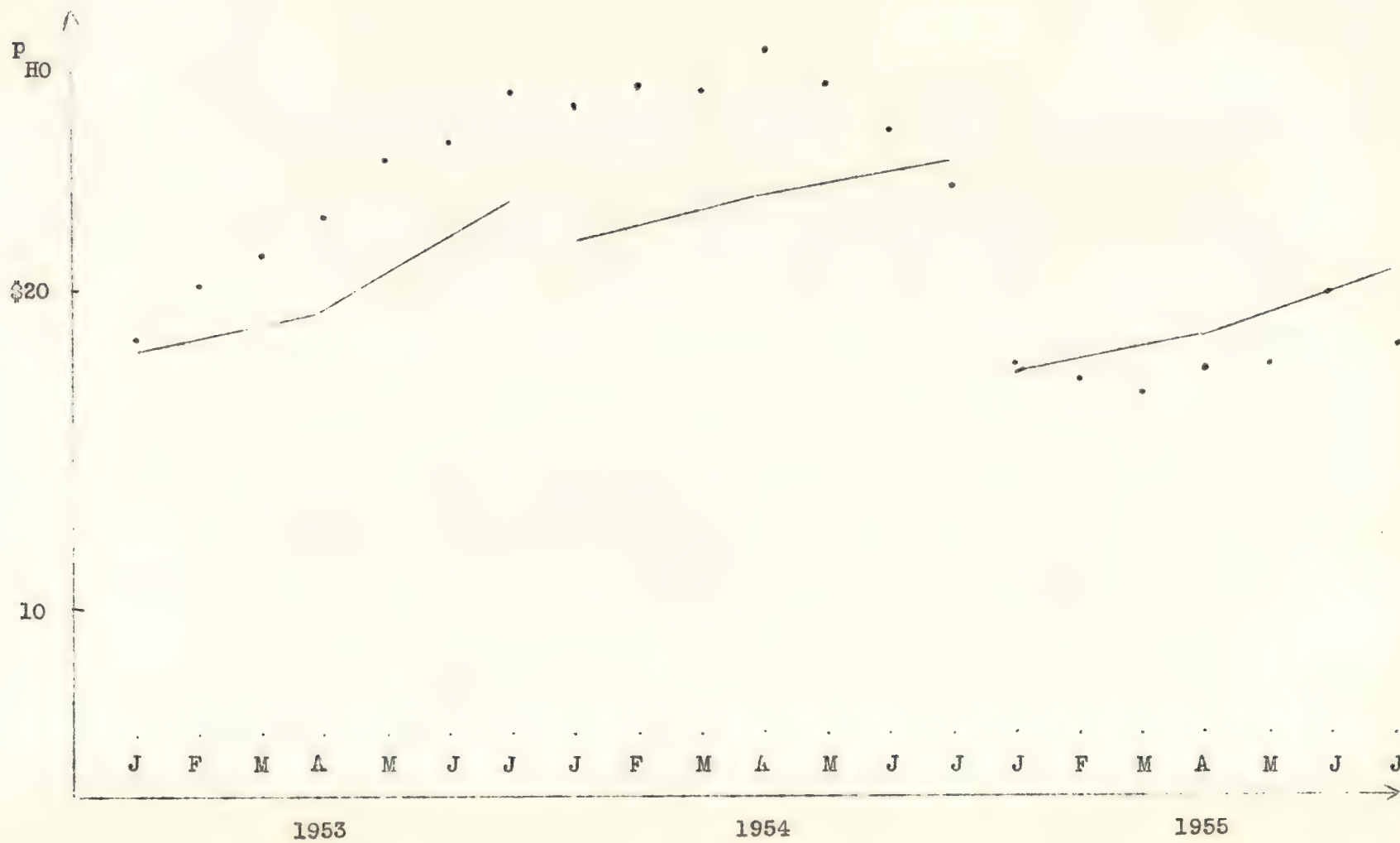
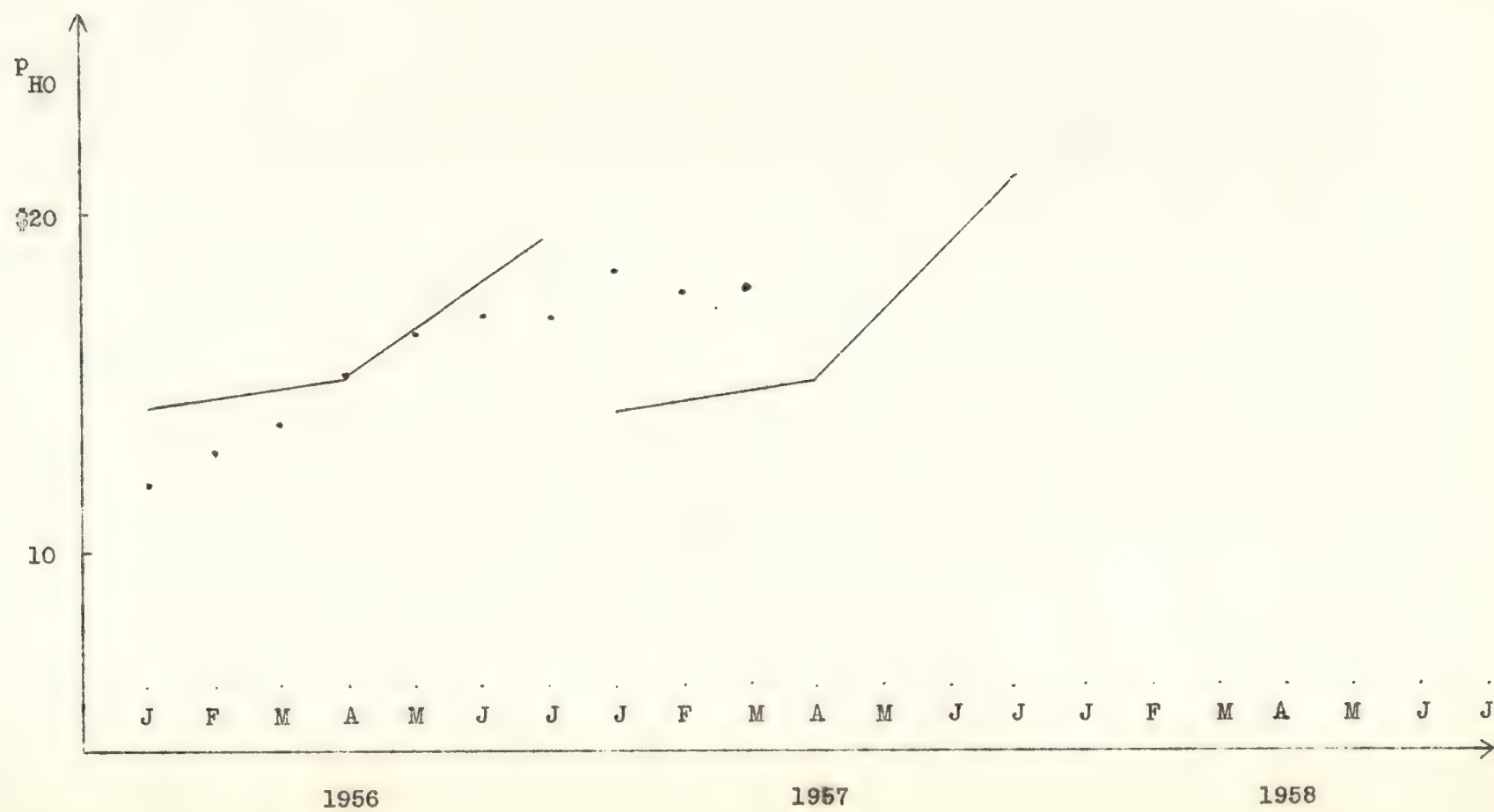




FIGURE 34 Continued



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PHYSICS DEPARTMENT

PHYSICS 309

LECTURE 1

1.1. THE CLASSICAL LIMIT

1.2. THE QUANTUM LIMIT

1.3. THE CORRESPONDENCE PRINCIPLE

1.4. THE SCHRÖDINGER EQUATION

1.5. THE HEISENBERG UNCERTAINTY PRINCIPLE

1.6. THE DIRAC EQUATION

1.7. THE PAULI EXCLUSION PRINCIPLE

1.8. THE BOSE-EINSTEIN CONDENSATE

1.9. THE FERMIONIC CONDENSATE

1.10. THE SUPERFLUIDITY OF HELIUM

1.11. THE SUPERCONDUCTIVITY OF COPPER

1.12. THE QUANTUM HALL EFFECT

TABLE 17

Final and Revised Final Forecasts of January-July Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	P'_{HO} a/	p_1	p_2 b/	p_4 based on p_1	p_4 based on p_1 and p_2	p_4 average	p_7 based on p_1	p_7 based on P'_{HO}	p_7 average	p_3	p_4 d/	p_5 d/	p_6 d/	p_7 d/
dollars														
1949	21.65	20.60	19.92	21.84	18.56	20.20	24.51	24.03	24.27	20.06	20.20	21.56	22.91	24.27
1950	19.02	16.04	17.30	17.00	19.82	18.41	19.09	21.11	20.10	17.86	n.r. e/	n.r.	n.r.	n.r.
1951	18.18	20.70	21.71	21.94	23.73	22.84	24.63	20.18	22.40	22.28	18.41	18.97	19.54	20.10
1952	18.62	17.65	17.38	18.71	16.84	17.78	21.00	20.67	20.84	17.63	n.r.	n.r.	n.r.	n.r.
1953	22.68	18.44	18.72	19.55	19.28	19.42	21.94	25.17	23.56	19.07	22.84	22.69	22.55	22.40
1954	20.58	25.88	26.55	27.43	27.89	27.66	30.80	22.84	26.82	27.11	n.r.	n.r.	n.r.	n.r.
1955	16.14	17.66	17.26	18.72	16.46	17.59	21.02	18.80	19.91	17.42	17.78	18.80	19.82	20.84
1956	19.84	11.99	14.05	12.71	18.17	15.44	14.27	22.02	18.14	14.74	n.r.	n.r.	n.r.	n.r.
1957	23.01	18.27	18.00	19.37	19.08	19.22	21.74	25.54	23.64	18.61	22.31	23.69	25.07	26.45
											27.66	27.38	27.10	26.82
											n.r.	n.r.	n.r.	n.r.
											17.59	18.36	19.14	19.91
											n.r.	n.r.	n.r.	n.r.
											15.44	16.34	17.24	18.14
											n.r.	n.r.	n.r.	n.r.
											19.22	20.69	22.17	23.64

a/ Revised estimates made in February.

b/ Actual prices for first week of February; also taken as p_2 .

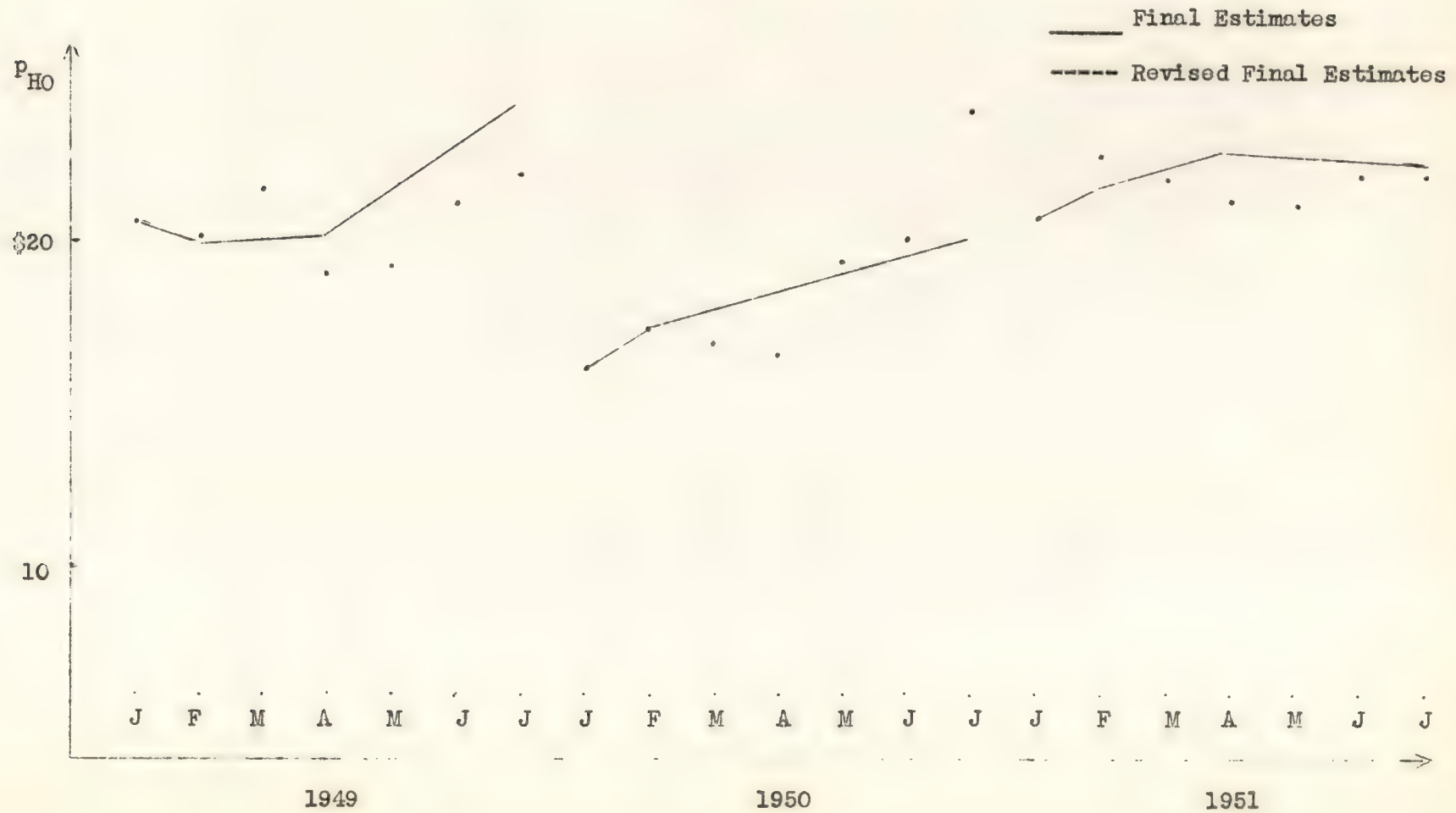
c/ $p_4 = p_1 - 3(p_1 - p_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. No revisions are made unless all estimates for February, March, and April are biased in the same direction and the April bias is greater than \$2.00. The revision for May, June, and July is a parallel extension of the previous estimates and is based on the actual price for April.

e/ N.r. means not revised.

FIGURE 35

Final and Revised Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (January-July)



1890

1891

1892

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1893

1894

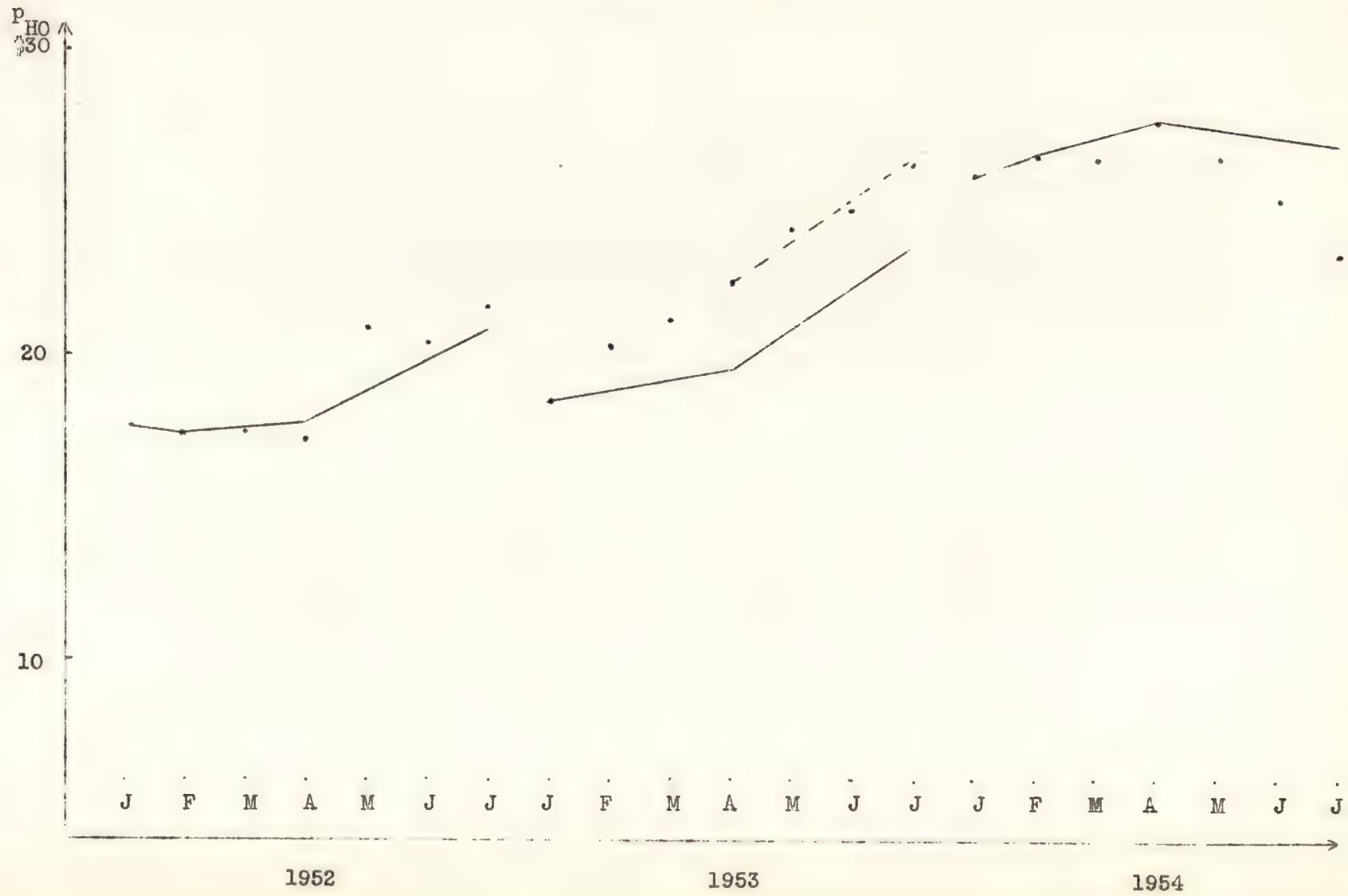
1895

1896
1897
1898
1899

THE YEAR OF THE GREAT FLOOD IN THE NORTH
AND THE YEAR OF THE GREAT DROUGHT IN THE SOUTH

1890

FIGURE 35 Continued

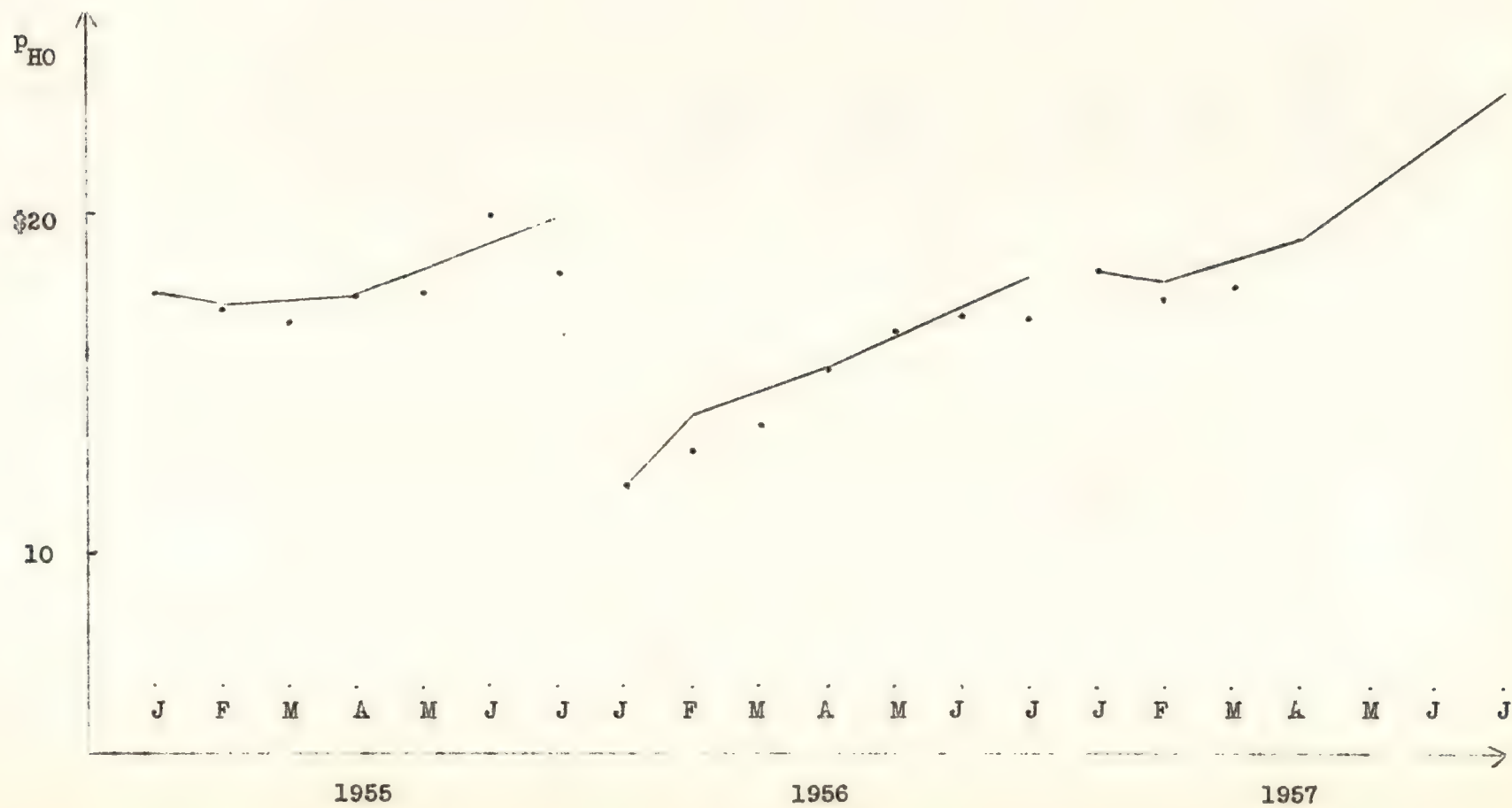


1. The first part of the paper is devoted to a general discussion of the problem. It is shown that the problem is of great importance in the theory of differential equations.



2. The second part of the paper is devoted to a detailed analysis of the problem. It is shown that the problem is of great importance in the theory of differential equations.

FIGURE 35 Continued



•

2017 82 07-07-07

2. August Through December Period

Preliminary forecasts for cattle are given in Table 18 and on Figure 36. Normally, the total of the monthly average prices at Omaha for the August through December period is equal to 5.1 times the annual average price level. The principle employed in these preliminary forecasts is to estimate the August price and then forecast a linear sequence through December so that their sum is equal to $5.1 P'_{BO}$. The August estimate is based on the final forecast for July through their relative indexes. The values headed by Δ are the monthly increments to add or subtract, sequentially, so that the above requirement is satisfied.

The revised forecasts for cattle are given in Table 19 and on Figure 36. The same basic principle is employed, namely, that the sum of the linear sequence of prices for August through December must equal a residual (not $5.1 P'_{BO}$ now) consistent with the estimated annual average price and the prices that have developed during the early part of the year. At this time (early June), the May price is available as well as the average price for the first week of June (taken as an estimate for all of June) so that, if the July price could be estimated, one could employ equation 9 to estimate P_{BO} by means of an estimated value for $\bar{P}_{BO,567}$. This is precisely what is done. Including the estimates for p_6 and p_7 , the sum for the first seven months (S'_7) can be computed. The total for the year can be estimated as $12P'_{BO}$ and the residual for the last five months as $12P'_{BO} - S'_7$. The forecast of p_8 is based on P'_{BO} and the increment, Δ , is computed so that $5p_8 + 10 \Delta = R$.

The final forecasts for cattle are given in Table 20 and on Figure 37. The same general procedure is employed as for the revised

to be reduced, thereby to

forecasts. By early August a better estimate of P_{BO} can be made and S_7 need not be estimated. The price for the first week of August (p_8') is available and is given either partial or full weight in estimating p_8 . Should P_8' differ greatly from what would be expected in relation to P_{BO}' , then full weight is given to the former.

The preliminary forecasts for hogs are given in Table 21 and on Figure 38. The final estimate of p_6 is used as $\bar{P}_{HO,567}$ in equation 10 to forecast P_{HO}' . The forecast for p_8 is also based on the final forecast of p_6 . A residual total for the last five months is estimated by $12P_{HO}' - S_7'$ is the sum of the final forecasts for January through July. The price sequence for August through December is linear through November with December being equated with November. Consequently, Δ is computed so that $5p_8 + 9\Delta = R$.

The revised forecasts for hogs are given in Table 22 and on Figure 38. The procedure parallels that given for cattle in Table 19 in most respects. The price for the first week of June (p_6') is taken as an estimate of $\bar{P}_{HO,567}$ and is used in equation 10 to estimate P_{HO}' . Forecasts for p_7 and p_8 are also based on p_6' and the relative indexes. The residual total for the last five months is estimated by $12P_{HO}' - S_7'$ and Δ computed so that $5p_8 + 9\Delta = R$.

Final forecasts for hogs are given in Table 23 and on Figure 39. Two residual totals are estimated, namely, $4.88P_{HO}'$ and $12P_{HO}' - S_7'$. The choice between the two is consistent with the relative sizes of p_8 and $1.12P_{HO}'$. After the selection of the consistent residual total, equal weight is given to the average price for the first week of August (p_8') and $1.12P_{HO}'$ (the normal estimate of p_8) unless the Δ computed is smaller than -2.50. If the latter occurs, then p_8' is given full weight as an estimate of p_8 .

forecasts. By early August a better estimate of P_{30} can be made and S_1 need not be estimated. The price for the first week of August (P_1) is available and is given either partial or full weight in estimating P_2 . Should P_1 differ greatly from what would be expected in relation to P_{30} , then full weight is given to the former.

The preliminary forecasts for hogs are given in Table 21 and on Figure 26. The final estimate of P_2 is used as $P_{30,267}$ in equation 10 to forecast P_{30} . The forecast for P_2 is also based on the final forecast of P_{30} . A residual total for the last five months is estimated by $12P_{30} - S_1$ is the sum of the final forecasts for January through July. The price schedule for August through December is known through November with December being equated with November. Consequently, Δ is computed so that $12P_{30} + 9\Delta = R$.

The revised forecasts for hogs are given in Table 22 and on Figure 27. The procedure parallels that given for cattle in Table 19 in most respects. The price for the first week of June (P_1) is taken as an estimate of $P_{30,267}$ and is used in equation 10 to estimate P_{30} . Forecasts for P_2 and P_3 are also based on P_{30} and the relative indexes. A residual total for the last five months is estimated by $12P_{30} - S_1$ and Δ computed so that $12P_{30} + 9\Delta = R$.

Final forecasts for hogs are given in Table 23 and on Figure 28. The residual totals are estimated, namely, $12P_{30} - S_1$ and $12P_{30} - S_2$. The choice between the two is consistent with the relative sizes of P_2 and P_3 . The average price for the first week of August (P_1) and $1.15P_{30}$ (the normal estimate of P_2) unless the Δ computed is smaller than -2.50 . If the latter occurs, then P_2 is given full weight as an estimate of P_2 .

TABLE 18

Preliminary Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	P_{BO}^a	$R = 5.1P_{BO}$	P_7^b	P_8 based on P_7	$\frac{\Delta R - 5P_8}{10}$	P_8	P_9	P_{10}	P_{11}	P_{12}
	dollars									
1949	29.51	150.50	26.32	26.85	1.62	26.85	28.47	30.09	31.71	33.33
1950	31.15	158.86	28.98	29.56	1.11	29.56	30.67	31.78	32.89	34.00
1951	31.34	159.83	31.90	32.54	- .29	32.54	32.25	31.96	31.67	31.38
1952	29.18	148.82	30.62	31.23	- .73	31.23	30.50	29.77	29.04	28.31
1953	25.81	131.63	25.66	26.17	.08	26.17	26.25	26.33	26.41	26.49
1954	22.70	115.77	22.29	22.74	.21	22.74	22.95	23.16	23.37	23.58
1955	22.86	116.59	24.20	24.68	- .68	24.68	24.00	23.32	22.64	21.96
1956	24.11	122.96	21.40	21.83	1.38	21.83	23.21	24.59	25.97	27.35
1957	24.85	126.74	22.12	22.56	1.39	22.56	23.95	25.34	26.73	28.12

a/ Revised estimates of P_{BO} made in February.

b/ Final estimates of P_7 made in February.

TABLE 19

Revised Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	p_4	p_5	$p_6^{a/}$	p_7 based on p_4 b/ and $p_6^{c/}$	$S_7' =$ $\sum_{i=1}^7 p_i^{c/}$	$\bar{p}_{567}^{d/}$	P_{BO}' based on $\bar{p}_{567}^{e/}$	$R =$ $12P_{BO}' - S_7'$	$\Delta =$ $\frac{R - 5p_8}{10}$	$p_8^{f/}$	p_9	p_{10}	p_{11}	p_{12}
	dollars													
1949	23.74	24.30	25.56	26.47	171.29	25.44	26.22	143.35	1.22	26.22	27.44	28.66	29.88	31.10
1950	27.24	28.66	29.50	30.63	199.37	29.60	29.94	159.91	1.02	29.94	30.96	31.98	33.00	34.02
1951	36.36	35.41	34.75	33.96	246.86	34.71	34.52	167.38	-.52	34.52	34.00	33.48	32.96	32.44
1952	33.73	33.08	32.18	31.41	233.13	32.22	32.29	154.35	-.71	32.29	31.58	30.87	30.16	29.45
1953	21.19	21.73	21.22	21.24	159.48	21.40	22.60	111.72	-.13	22.60	22.47	22.34	22.21	22.08
1954	23.90	23.14	23.28	22.97	163.79	23.13	24.15	126.01	.53	24.15	24.68	25.21	25.74	26.27
1955	24.32	22.20	22.06	20.93	168.53	21.73	22.89	106.15	-.83	22.89	22.06	21.23	20.40	19.57
1956	20.28	20.26	20.45	20.54	141.31	20.42	21.72	119.33	1.07	21.72	22.79	23.86	24.93	26.00

a/ Actual prices for first week of June; also taken as estimates for p_6 .

b/ Linear extrapolation based on p_4 and p_6 .

c/ $p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_7$ (based on p_4 and p_6).

d/ $\frac{1}{3}(p_5 + p_6 + p_7)$ (based on p_4 and p_6).

e/ Based on using p_{567} in equation 9.

f/ p_8 is based on P_{BO}' based on \bar{p}_{567} .

Based on pages 110-111 in document 2:

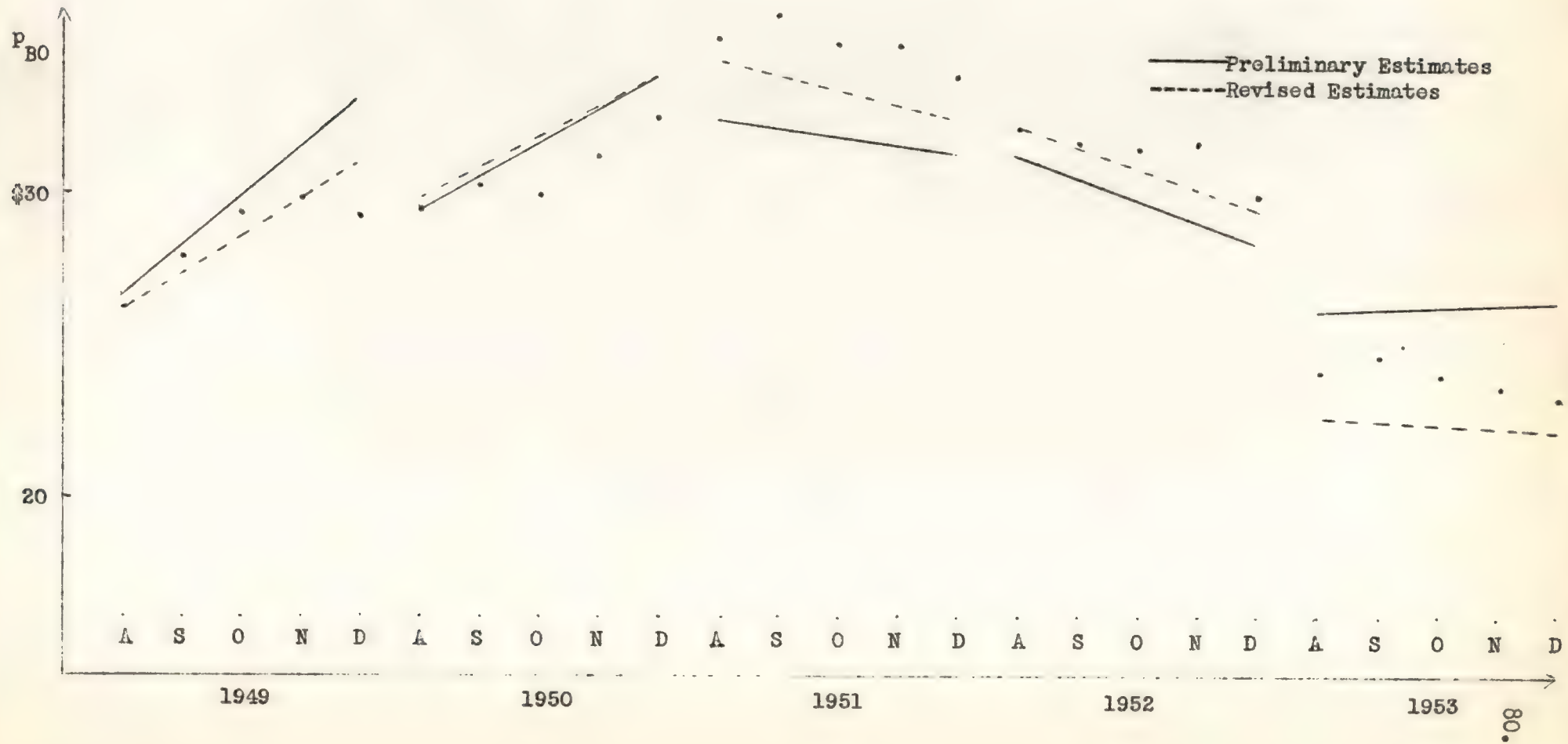
THE UNIVERSITY OF CHICAGO PRESS

$$2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20 + 22 + 24 + 26 + 28 + 30 + 32 + 34 + 36 + 38 + 40 + 42 + 44 + 46 + 48 + 50 + 52 + 54 + 56 + 58 + 60 + 62 + 64 + 66 + 68 + 70 + 72 + 74 + 76 + 78 + 80 + 82 + 84 + 86 + 88 + 90 + 92 + 94 + 96 + 98 + 100$$

LET 300 TO 717, KONG CHANG STREET, STONE ISLAND, MASSACHUSETTS 01907, U.S.A.

FIGURE 36

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (August-December)



1000

1000

1000

1000

1000

1000

1000

1000

FIGURE 36 Continued

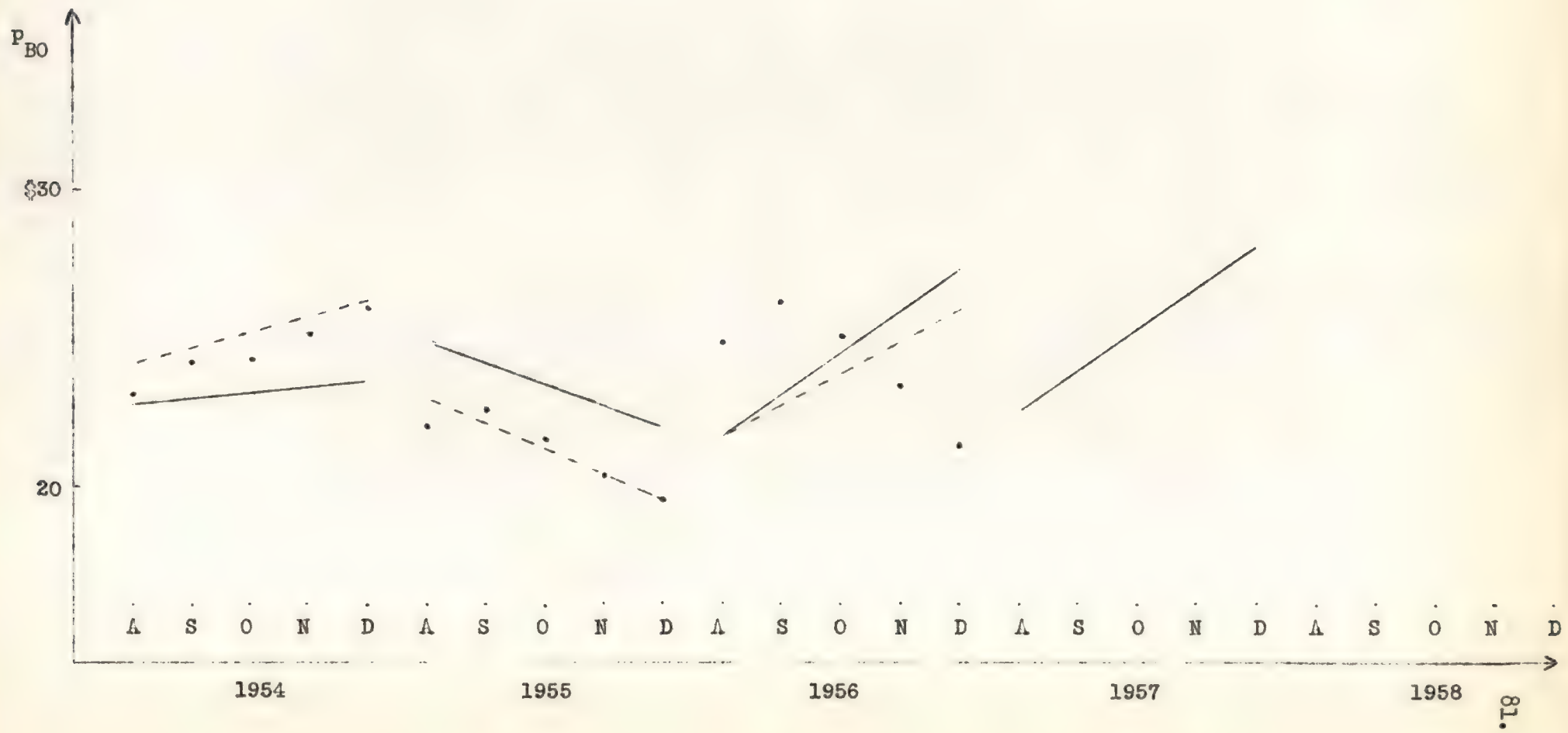


FIGURE 10

TABLE 20

Final Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

Year	$P'_{B0} \frac{a}{}$	$12P'_{B0}$	$S_7 = \sum_{i=1}^7 p_i$	$R = 12P'_{B0} - S_7$	$5p_8$	$\Delta = \frac{R - 5p_8}{10}$	$\bar{P} = \frac{p'_8 + P'_{B0}}{2}$	$p_8 \frac{b}{}$	p_9	p_{10}	p_{11}	p_{12}	$p'_8 \frac{c}{}$
	dollars												
1949	26.05	312.60	170.73	141.87	129.80	1.21	25.96	25.96	27.17	28.38	29.59	30.80	25.88
1950	29.63	355.56	198.32	157.24	148.40	.88	29.68	29.68	30.56	31.44	32.32	33.20	29.72
1951	34.77	417.24	247.70	169.54	174.70	-.52	34.94	34.94	34.42	33.90	33.38	32.86	35.10
1952	32.43	389.16	233.61	155.55	161.00	-.55	32.20	32.20	31.65	31.10	30.55	30.00	31.98
1953	23.16	277.92	161.37	116.55	118.65	-.21	23.73	23.73	23.52	23.31	23.10	22.89	24.30
1954	23.76	285.12	162.50	122.62	115.50	.71	23.10	23.10	23.81	24.52	25.23	25.94	22.45
1955	23.21	278.52	169.61	108.91	112.10	-.32	22.42	22.42	22.10	21.78	21.46	21.14	21.62
1956	22.19	266.28	142.86	123.42	121.00	.24	23.20	24.20	24.44	24.68	24.92	25.16	24.20

a/ Final estimates (2).

b/ p_8 is taken as \bar{P} if $|p'_8 - P'_{B0}| < \$1.75$; otherwise $p_8 = p'_8$.

c/ p'_8 is the weekly average price for the first effective week of August.

The $\hat{\beta}_1^0$ is the least squares estimate of the regression function of y on x .

The $\hat{\beta}_1^0$ is given by $\hat{\beta}_1^0 = \frac{S_{xy}}{S_{xx}}$ where $S_{xy} = \sum (x_i - \bar{x})(y_i - \bar{y})$ and $S_{xx} = \sum (x_i - \bar{x})^2$.

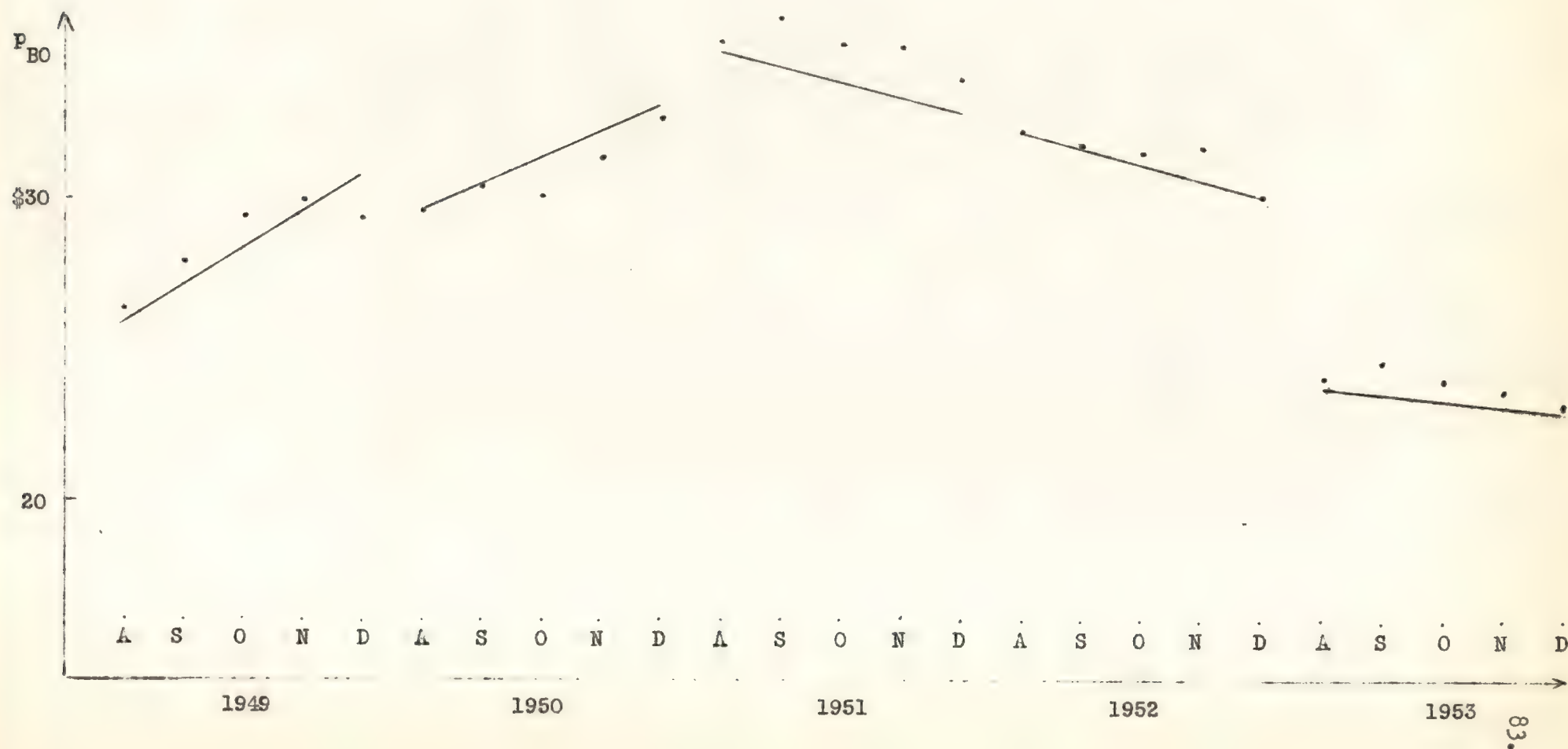
The least squares estimate of β_1 is

1000	1075	500*22	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*25	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*28	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*31	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*34	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*37	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*40	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*43	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*46	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*49	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*52	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*55	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*58	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*61	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*64	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*67	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*70	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*73	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*76	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*79	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*82	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*85	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*88	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*91	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*94	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*97	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000
1000	1075	500*100	700*20	100*20	100*20	100	1000	10000	10000	10000	10000	10000	10000

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FIGURE 37

Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (August-December)



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FIGURE 37 Continued

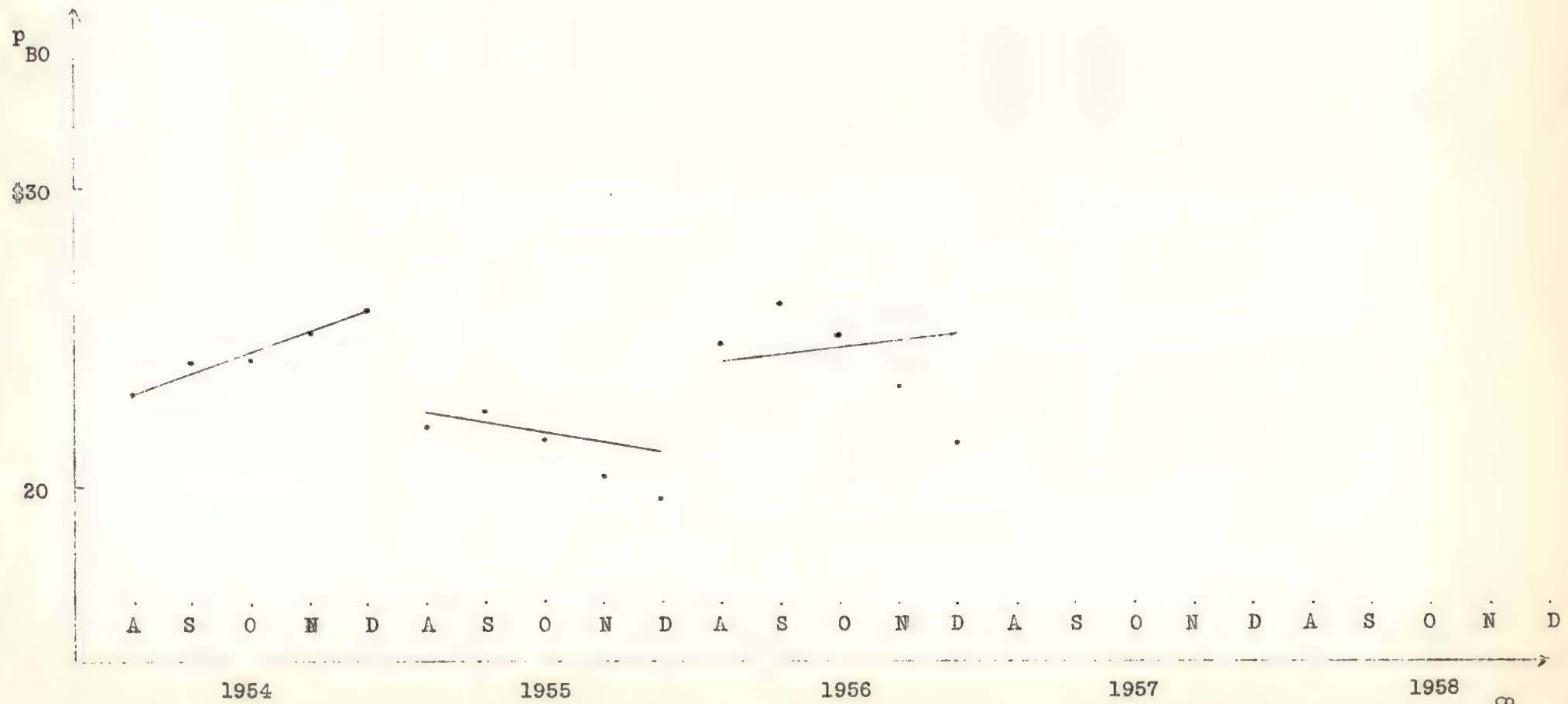


TABLE 21

Preliminary Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	p_6^a	P'_{HO} based on p_6^b	$12P'_{HO}$	$S'_7 =$ $\sum_{i=1}^7 p_i^c$	$12P'_{HO} - S'_7$	p_8 based on p_6	$\Delta =$ $\frac{R - 5p_8}{9}$	p_8	p_9	p_{10}	p_{11}	p_{12}
dollars												
1949	22.91	21.11	253.32	149.52	103.80	23.60	-1.58	23.60	22.02	20.44	18.86	18.86
1950	19.54	17.69	212.28	128.22	84.06	20.13	-1.84	20.13	18.29	16.45	14.61	14.61
1951	22.55	20.74	248.88	155.17	93.71	23.23	-2.49	23.23	20.74	18.25	15.76	15.76
1952	19.82	17.98	215.76	129.00	86.76	20.41	-1.70	20.41	18.71	17.01	15.31	15.31
1953	22.18	20.37	244.44	142.19	102.25	22.85	-1.33	22.85	21.52	20.19	18.86	18.86
1954	27.10	25.34	304.08	188.50	115.58	27.91	-2.50 ^d	27.91	25.41	22.91	20.41	20.41
1955	19.14	17.29	207.48	127.34	80.14	19.71	-2.05	19.71	17.66	15.61	13.56	13.56
1956	17.24	15.37	184.44	107.94	76.50	17.76	-1.37	17.76	16.39	15.02	13.65	13.65
1957	22.17	20.36	244.32	140.60	103.72	22.84	-1.16	22.84	21.68	20.52	19.36	19.36

a/ Final estimates made in February of given year.

b/ p_6 is used in equation 10 as an estimate of \bar{p}_{567} since p_5 , p_6 , and p_7 , as estimated, lie on a straight line.

c/ S'_7 is the sum of the January-July final estimates.

d/ Whenever Δ , as computed, is less than -2.50, then $\Delta = -2.50$ is used.

100. 500 20 000 100000 500000 1000000 5000000 10000000 50000000 100000000 500000000 1000000000

TABLE 22

Revised Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	p_6^a	P_{HO}^b based on p_6^b	p_7 based on p_6^b	p_8 based on p_6^b	$12P_{HO}^c$	S_7^c $\sum_{i=1}^7 p_i^c$	$R =$ $12P_{HO}^c - S_7^c$	$\Delta =$ $\frac{R - 5p_8}{9}$	p_8	p_9	p_{10}	p_{11}	p_{12}
	dollars												
1949	21.91	20.09	22.35	22.58	241.08	144.80	96.28	-1.85	22.58	20.73	18.88	17.03	17.03
1950	19.78	17.94	20.18	20.37	215.28	126.02	89.26	-1.40	20.37	18.97	17.57	16.17	16.17
1951	21.50	19.68	21.93	22.14	236.16	151.33	84.83	-2.50 ^d	22.14	19.64	17.14	14.64	14.64
1952	20.60	18.77	21.01	21.22	225.24	132.12	93.12	-1.44	21.22	19.78	18.34	16.90	16.90
1953	25.05	23.27	25.55	25.80	279.24	156.82	122.42	- .73	25.80	25.07	24.34	23.61	23.61
1954	26.12	24.35	26.64	26.90	292.20	185.67	106.53	-2.50 ^d	26.90	24.40	21.90	19.40	19.40
1955	18.78	16.93	19.16	19.34	203.16	124.70	78.46	-2.03	19.34	17.31	15.28	13.25	13.25
1956	17.32	15.46	17.67	17.84	185.52	105.47	80.05	-1.02	17.84	16.82	15.80	14.78	14.78

a/ Actual prices for first effective week of June.

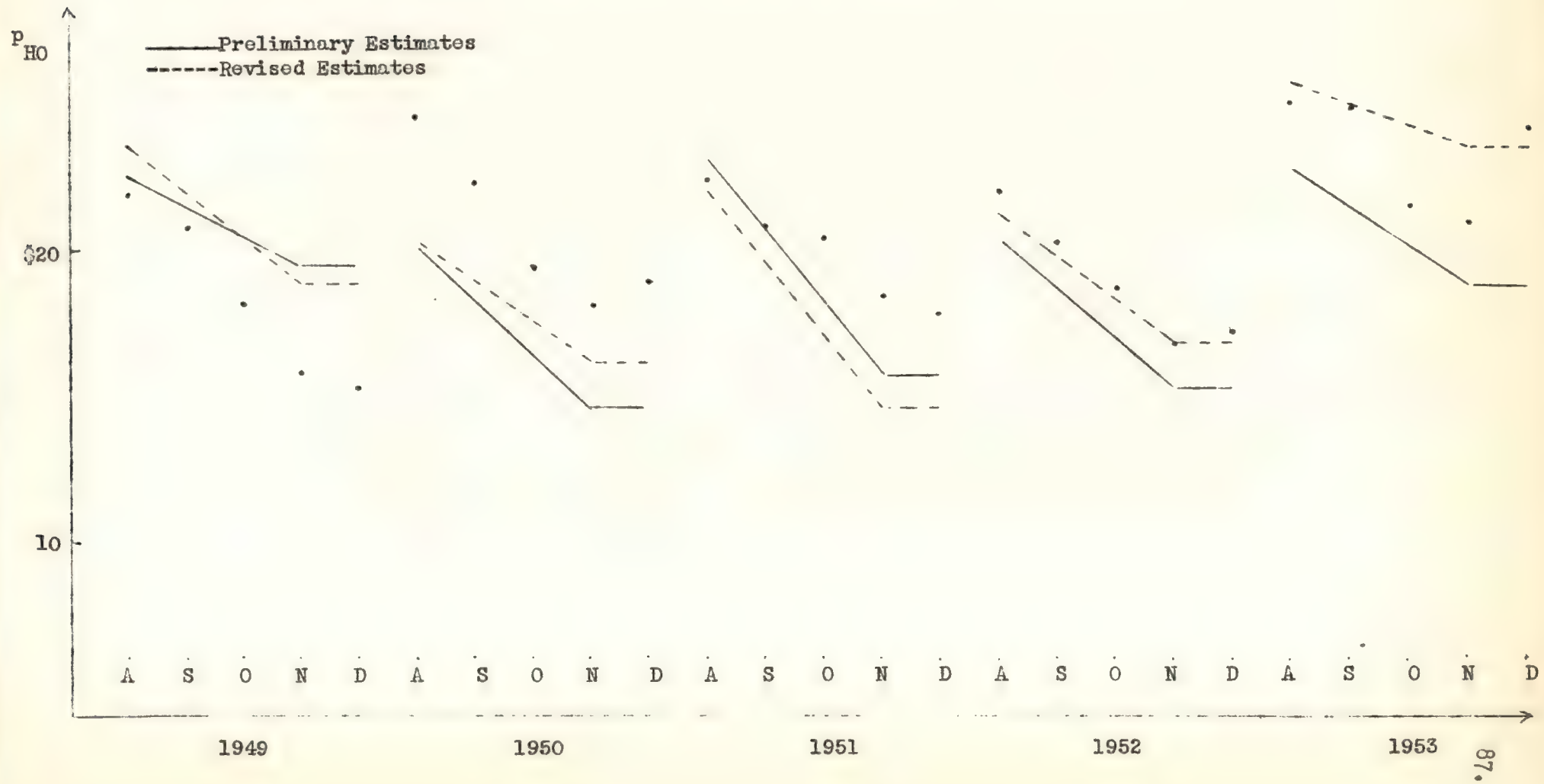
b/ p_6^b is used in equation 10 as an estimate of \bar{p}_{567} .

c/ $S_7^c = (p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_7(\text{based on } p_6^b))$.

d/ If Δ is less than -2.50 when computed, then $\Delta = -2.50$ is used.

FIGURE 38

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (August-December)



FOR THE YEAR 1911, THE TOTAL OF THE
12 MONTHS OF THE YEAR 1911, THE TOTAL OF THE

FIGURE 38 Continued

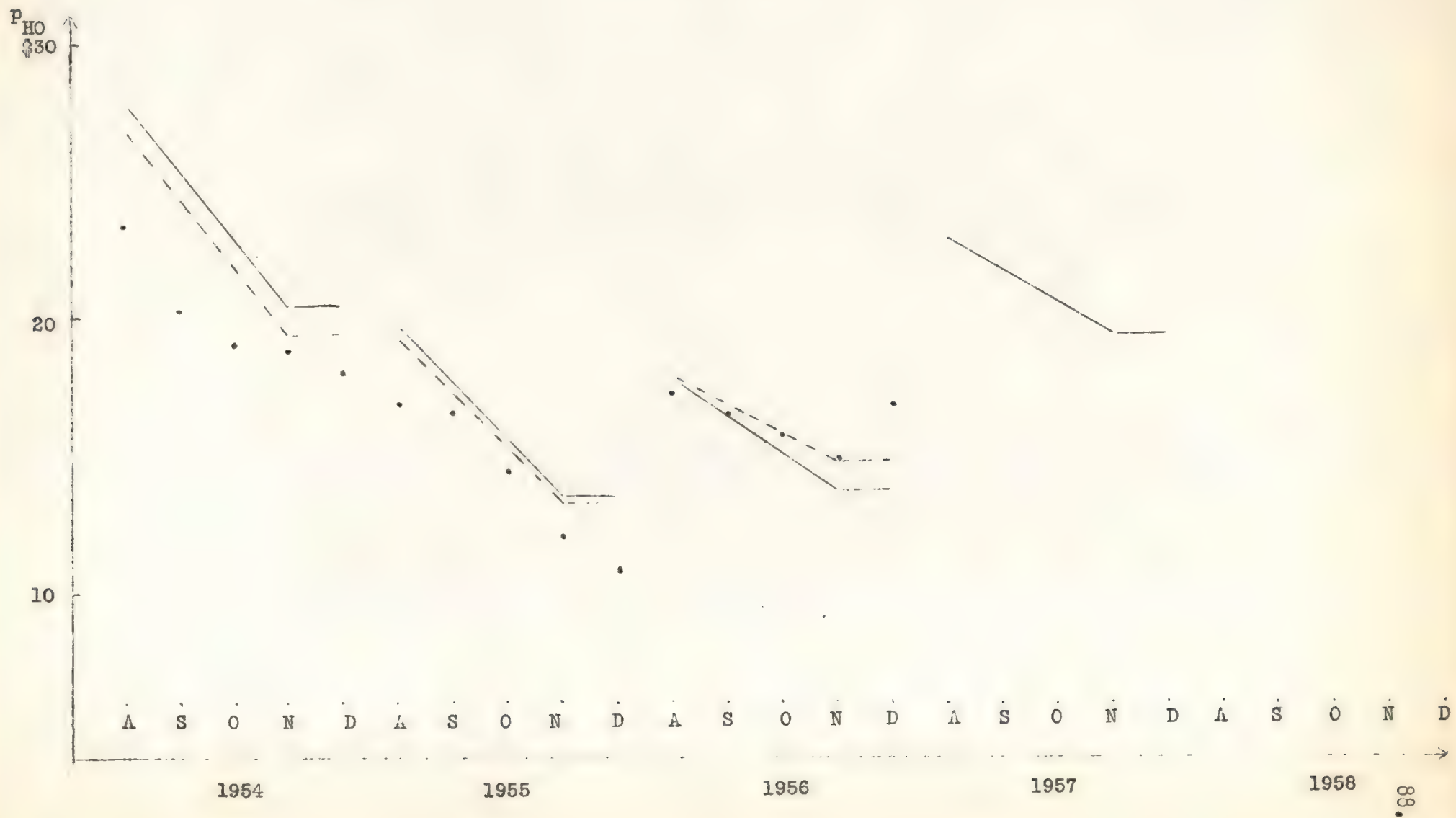


TABLE 23

Final Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha

Year	$P'_{HO} \text{ a/}$	$12P'_{HO}$	S_7 $\sum_{i=1}^7 P_i$	$R =$ $12P'_{HO} - S_7$	$\bar{R} =$ $4.88P'_{HO}$	$\bar{p} =$ $\frac{p'_8 + 1.12P'_{HO}}{2}$	$\Delta =$ $\frac{R' - 5p'_8 \text{ b/}}{9}$	$p'_8 \text{ c/}$	p_9	p_{10}	p_{11}	p_{12}	p'_8	$1.12P'_{HO}$
	dollars													
1949	18.98	227.76	143.76	84.00	92.62	21.97	-1.91	21.97	20.06	18.15	16.24	16.24	22.68	21.26
1950	19.35	232.20	130.21	101.99	94.43	22.92	-1.40	22.92	21.52	20.12	18.72	18.72	24.18	21.67
1951	19.93	239.16	151.99	87.17	97.26	22.56	-1.73	22.56	20.83	19.10	17.37	17.37	22.81	22.32
1952	19.08	228.96	132.45	96.51	93.11	22.13	-1.57	22.13	20.56	18.99	17.42	17.42	22.89	21.37
1953	23.28	279.36	157.24	122.12	113.61	25.72	-1.67	25.72	24.05	22.38	20.71	20.71	25.38	26.07
1954	23.15	277.80	181.17	96.63	112.97	24.58	-2.16	23.22	21.06	18.90	16.74	16.74	23.22	25.93
1955	16.74	200.88	124.91	75.97	81.69	17.46	-1.26	17.46	16.20	14.94	13.68	13.68	16.18	18.75
1956	14.91	178.92	104.35	74.57	72.76	16.96	-1.14	16.97	15.83	14.69	13.55	13.55	17.22	16.70

a/ Final estimates (2).

b/ R' is larger or smaller of R or \bar{R} depending on whether p'_8 is greater or smaller than $1.12P'_{HO}$. Furthermore, $p' = \bar{p}$ unless $|\Delta| > 2.50$; otherwise, $p' = p'_8$. p_8 is the actual average price for the first week of August.

c/ $p_8 = p'$.

FIGURE 39

Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (August-December)

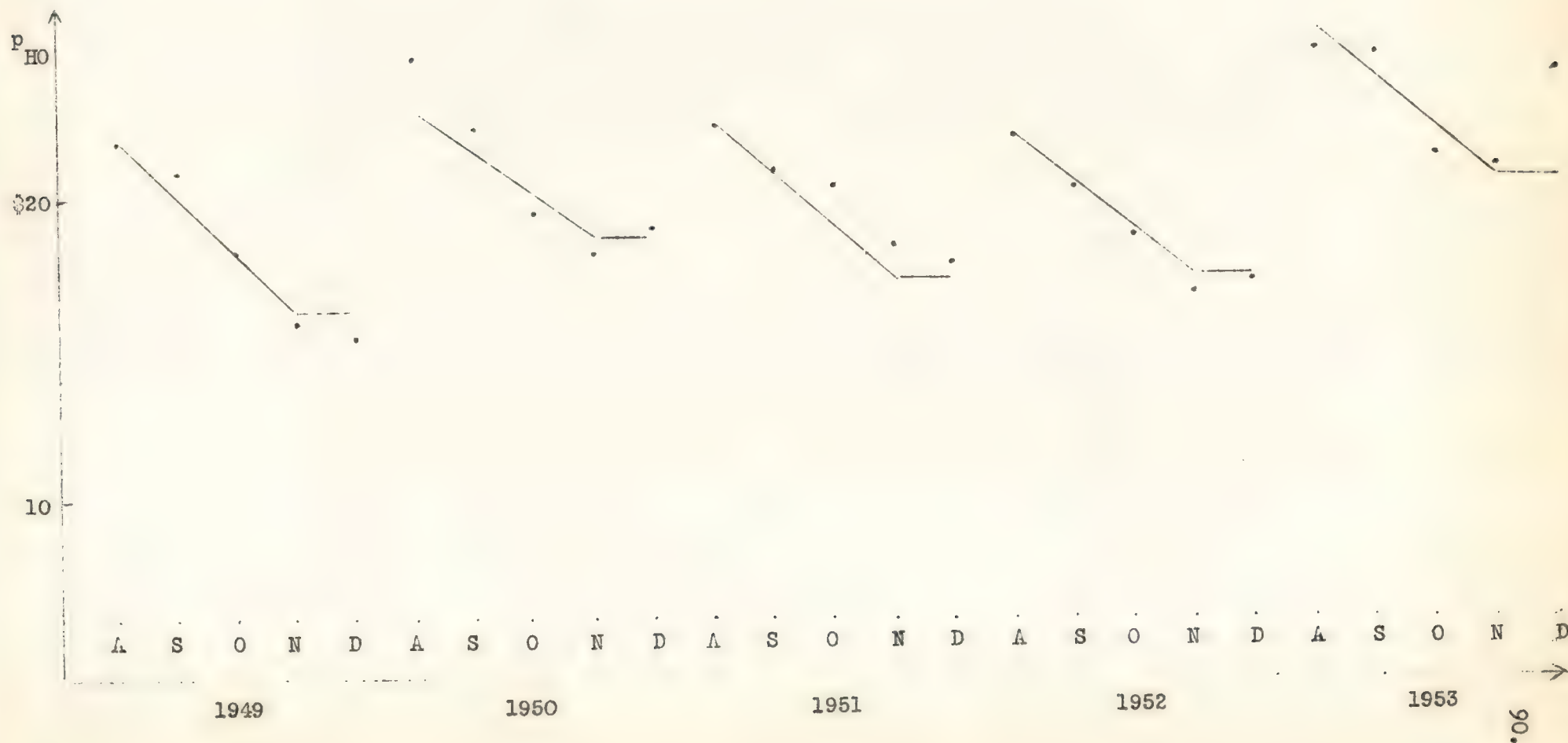
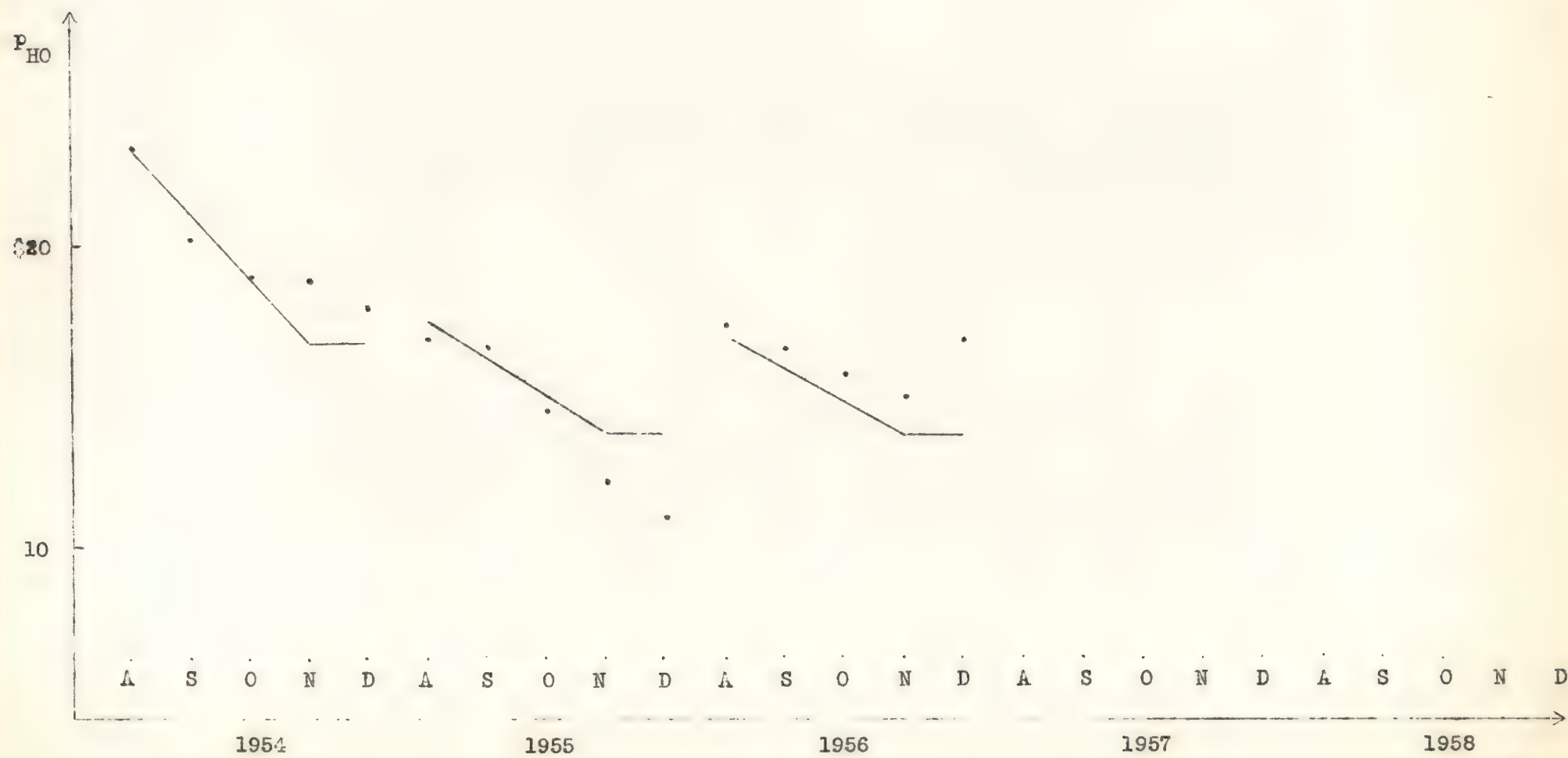


FIGURE 39 Continued





C. Los Angeles Market

The computations, tables, and figures underlying the forecasts for the Los Angeles market parallel comparable data for the Omaha markets so no specific discussion will be given. The only differences lie in separate indexes of seasonal variation, prices as of the first week of specific months, equations relating annual price levels to monthly price levels, and estimates of the annual average prices. To guide the reader on these paralleling aspects the following listing is provided.

Omaha Market

Table 14
Figure 32

Table 15
Figure 33

Table 16
Figure 34

Table 17
Figure 35

Table 18
Table 19
Figure 36

Table 20
Figure 37

Table 21
Table 22
Figure 38

Table 23
Figure 39

Los Angeles Market

Table 24
Figure 40

Table 25
Figure 41

Table 26
Figure 42

Table 27
Figure 43

Table 28
Table 29
Figure 44

Table 30
Figure 45

Table 31
Table 32
Figure 46

Table 33
Figure 47

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TABLE 24

Preliminary and Revised Forecasts of January-July Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

Year	P _{BLA} ^{a/}	P ₁₂ ^{b/}	P ₁ based on P ₁₂	P ₄ based on P ₁₂	P ₇ based on P ₁₂	P ₇ based on P _{BLA}	P ₇ average	P ₁ ^{c/}	P ₂ ^{c/}	P ₃ ^{c/}	P ₄ ^{c/}	P ₅ ^{c/}	P ₆ ^{c/}	P ₇ ^{c/}
dollars														
1950	29.06	27.10	26.83	26.83	27.37	29.35	28.36	26.83	26.83	26.83	26.83	27.34	27.85	28.36
	29.06	26.25	25.99	25.99	26.51	29.35	27.93	25.99	25.99	25.99	25.99	26.64	27.28	27.93
1951	29.02	33.07	32.74	32.74	33.40	29.31	31.36	32.74	32.74	32.74	32.74	32.28	31.82	31.36
	29.02	31.75	31.43	31.43	32.08	29.31	30.70	31.43	31.43	31.43	31.43	31.19	30.94	30.70
1952	26.69	33.41	33.08	33.08	33.74	26.96	30.35	33.08	33.08	33.08	33.08	32.17	31.26	30.35
	26.69	35.85	35.49	35.49	36.21	26.96	31.58	35.49	35.49	35.49	35.49	34.19	32.88	31.58
1953	25.80	27.26	26.99	26.99	27.53	25.86	26.70	26.99	26.99	26.99	26.99	26.89	26.80	26.70
	25.80	29.00	28.71	28.71	29.29	25.86	27.58	28.71	28.71	28.71	28.71	28.33	27.96	27.58
1954	23.17	21.14	20.93	20.93	21.35	23.40	22.38	20.93	20.93	20.93	20.93	21.41	21.90	22.38
	23.17	23.50	23.26	23.26	23.74	23.40	23.57	23.26	23.26	23.26	23.26	23.36	23.47	23.57
1955	23.86	23.88	23.64	23.64	24.12	24.10	24.11	23.64	23.64	23.64	23.64	23.80	23.95	24.11
	23.86	23.00	22.77	22.77	23.23	24.10	23.66	22.77	22.77	22.77	22.77	23.07	23.36	23.66
1956	24.91	21.39	21.18	21.18	21.60	25.16	23.38	21.18	21.18	21.18	21.18	21.91	22.65	23.38
	24.91	20.00	19.80	19.80	20.20	25.16	22.68	19.80	19.80	19.80	19.80	20.76	21.72	22.68
1957	25.08	21.72	21.50	21.50	21.94	25.33	23.64	21.50	21.50	21.50	21.50	22.21	22.93	23.64
	25.08	21.00	20.79	20.79	21.21	25.33	23.27	20.79	20.79	20.79	20.79	21.62	22.44	23.27

a/ Preliminary estimates made in August of preceding year.

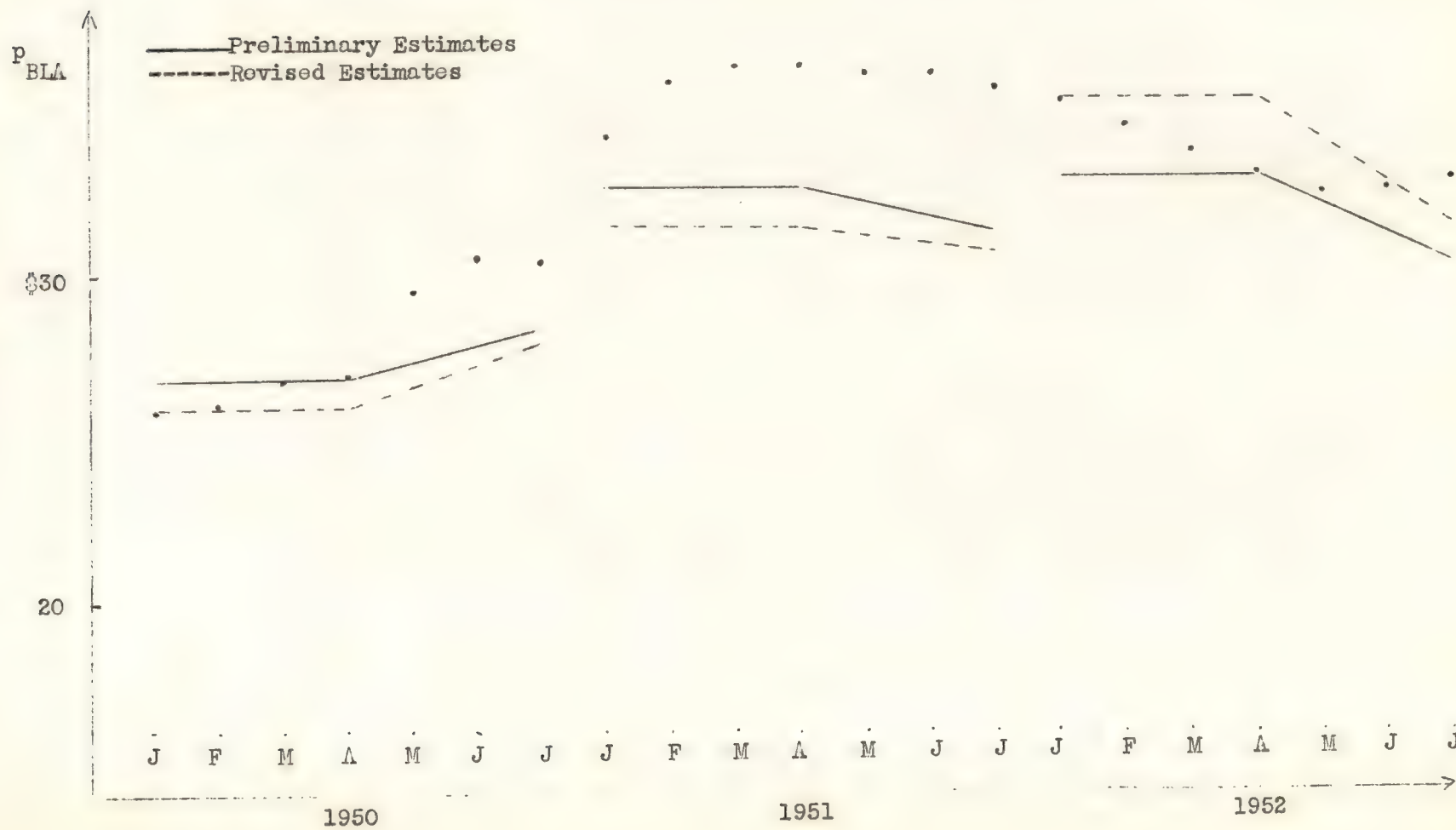
b/ Final estimates of P₁₂ for previous year (upper). Actual prices for first week of December (lower).

c/ Upper values are preliminary estimates made in August of preceding year. Lower values are revised estimates made in December of preceding year.

1. The above information was obtained from the files of the Department of the Army, Office of the Adjutant General, and is being furnished to you for your information.

FIGURE 40

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (January-July)

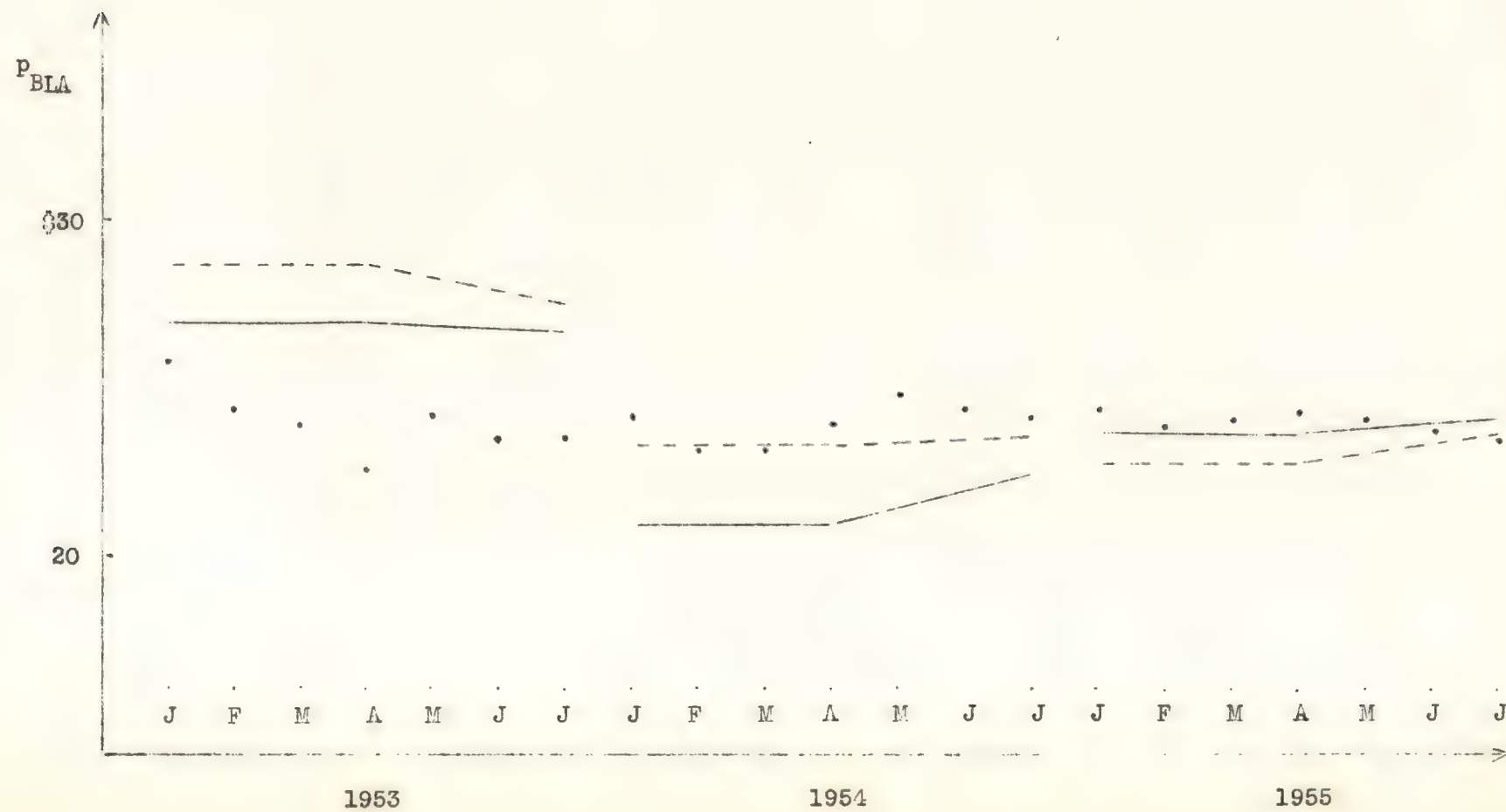


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FIGURE 40 Continued



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VOL. LXXV. PART 1.
1945.

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FIGURE 40 Continued

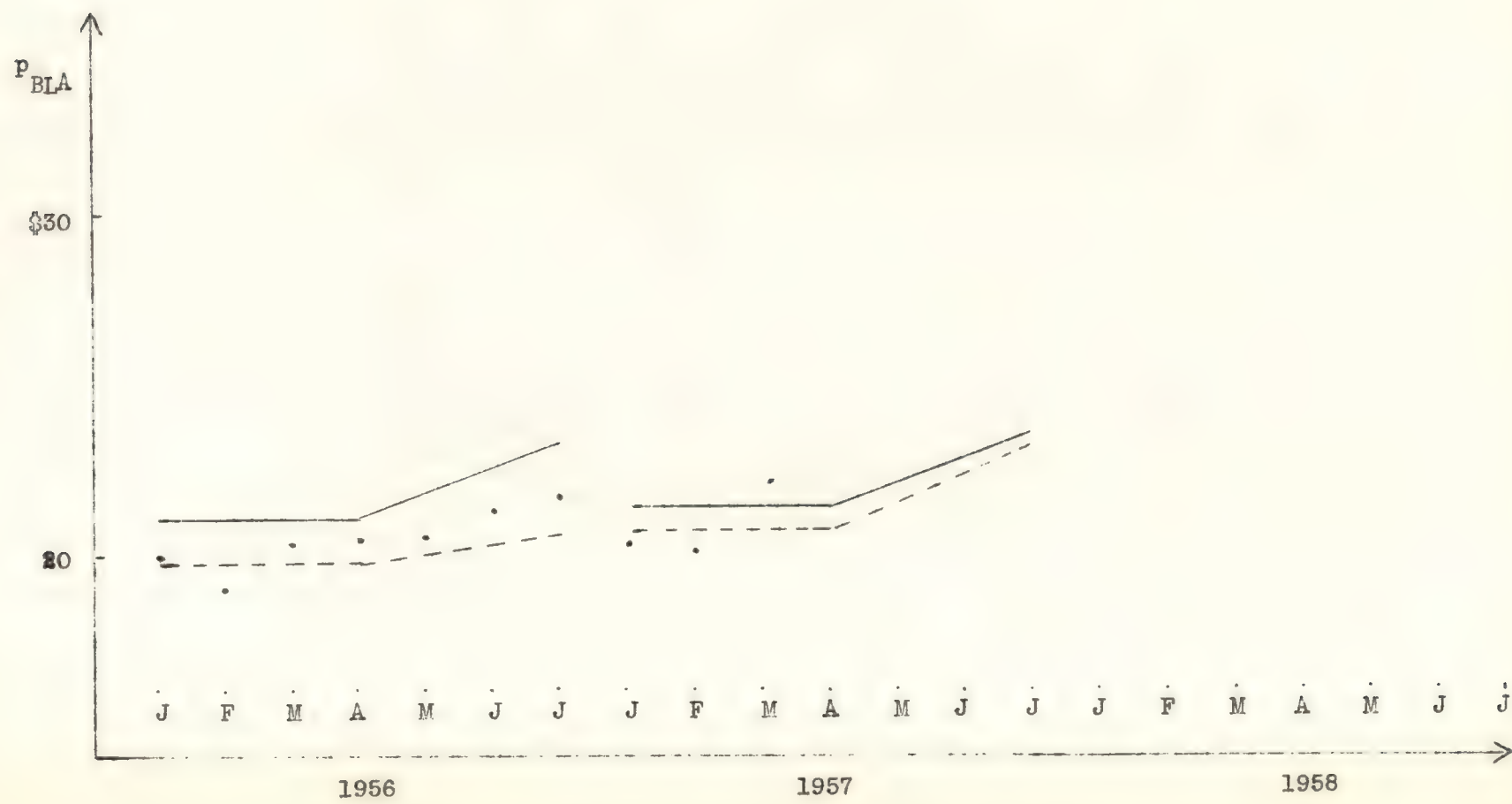




TABLE 25

Final and Revised Final Forecasts of January-July Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

Year	$P'_{BLA} \frac{a}{/}$	p_1	$p_2' \frac{b}{/}$	p_4 based on p_1	p_4 based on p_1 and $p_2' \frac{c}{/}$	p_4 aver- age	p_7 based on p_1	p_7 based on P'_{BLA}	p_7 aver- age	p_3	$p_4 \frac{d}{/}$	$p_5 \frac{d}{/}$	$p_6 \frac{d}{/}$	$p_7 \frac{d}{/}$
dollars														
1949	29.29	23.90	22.00	23.90	18.20	21.05	24.38	29.58	26.98	21.52	21.05	23.03	25.00	26.98
											23.08	25.06	27.03	29.01
1950	30.85	25.88	26.00	25.88	25.64	25.76	26.40	31.16	28.78	25.88	25.76	26.77	27.77	28.78
											26.37	27.38	28.38	29.39
1951	31.03	34.25	35.00	34.25	32.75	33.50	34.94	31.34	33.14	34.25	33.50	33.38	33.26	33.14
											35.00	34.88	34.76	34.64
1952	28.98	35.37	34.00	35.37	38.11	36.74	36.08	29.27	32.68	35.37	36.74	35.39	34.03	32.68
											34.92	33.57	32.21	30.86
1953	25.77	25.77	24.50	25.77	28.31	27.04	26.29	26.03	26.16	25.77	27.04	26.75	26.45	26.16
											24.80	24.51	24.21	23.92
1954	22.81	24.16	23.50	24.16	25.46	24.81	24.64	23.04	23.84	24.16	24.81	24.49	24.16	23.84
											24.36	24.03	23.70	23.39
1955	22.96	24.38	23.50	24.38	26.18	25.28	24.87	23.19	24.03	24.39	25.28	24.86	24.45	24.03
											24.83	24.41	24.00	23.58
1956	24.15	19.90	18.75	19.90	22.20	21.05	20.30	24.39	22.34	19.90	21.05	21.48	21.91	22.34
											20.74	21.17	21.60	22.03
1957	24.86	20.25	19.75	20.25	21.25	20.75	20.66	25.11	22.88	20.25	20.75	21.46	22.17	22.88

a/ Revised estimates made in February.

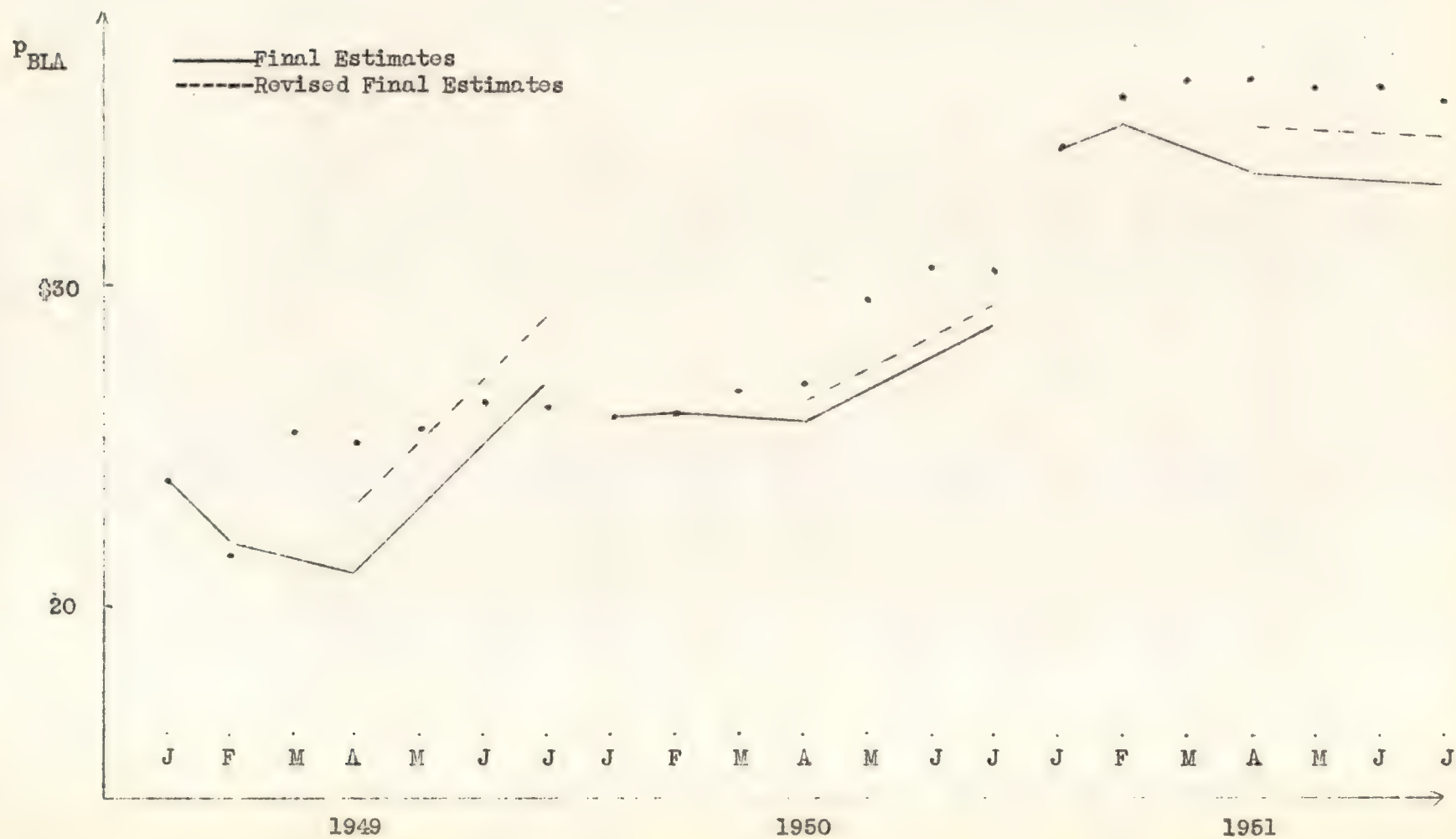
b/ Actual prices for first week of February; also taken as p_2 .

c/ $p_4 = p_1 - 3(p_1 - p_2')$.

d/ Lower values are revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. The value for April is the average of the predicted and actual price. May, June, and July are extended parallel to the previous estimates.

FIGURE 41

Final and Revised Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (January-July)



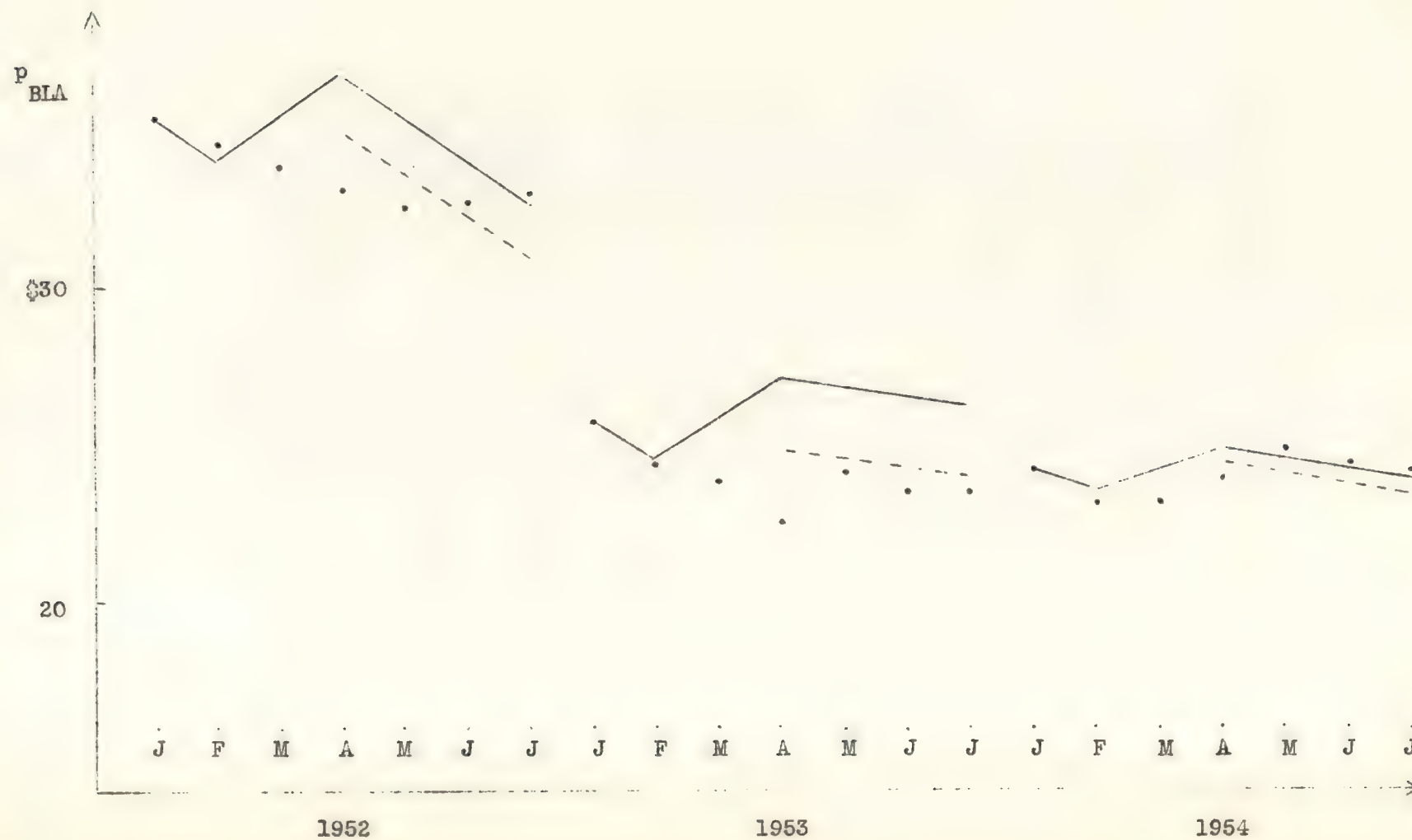
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FIGURE 41 Continued



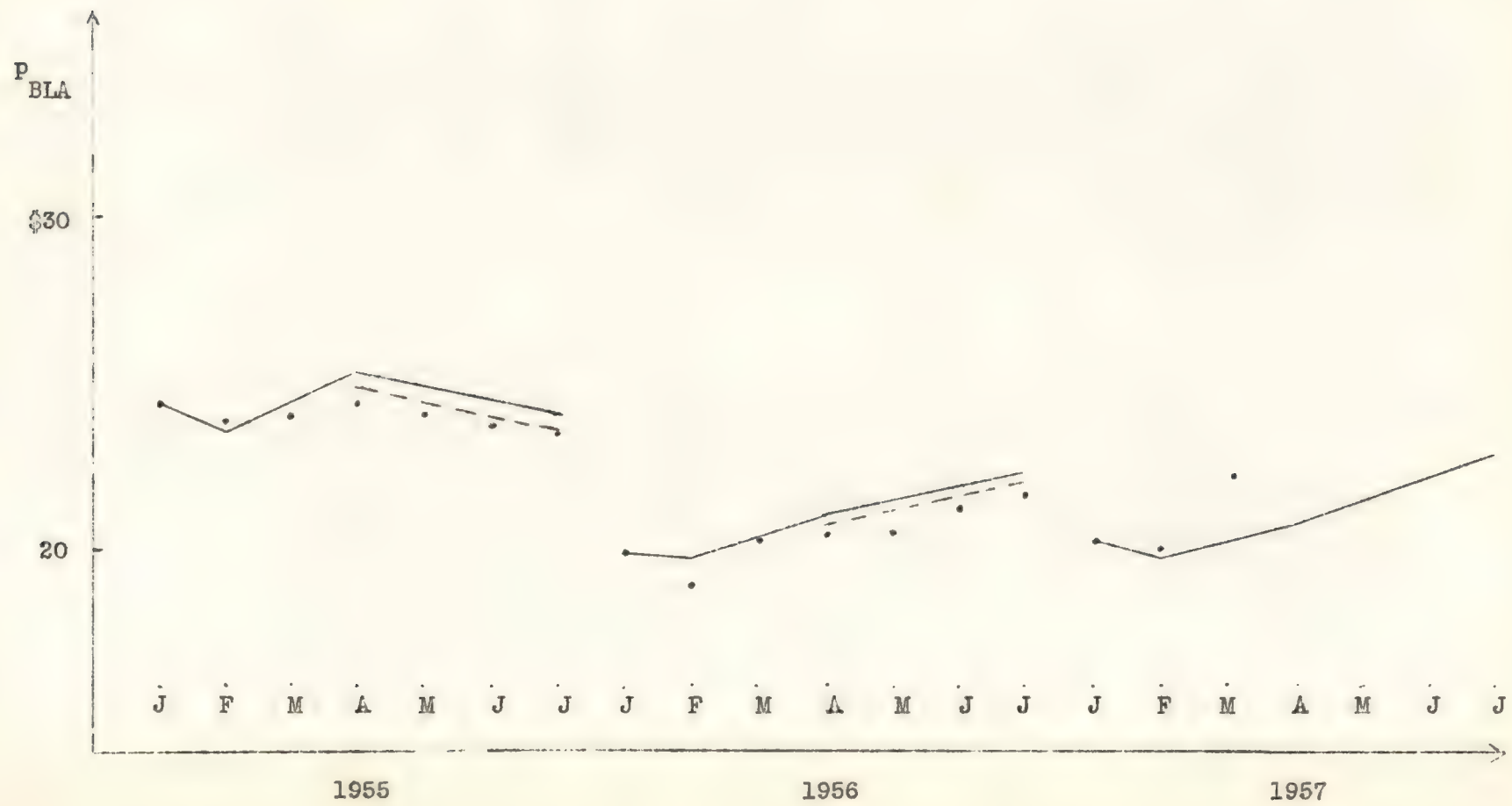
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FIGURE 41 Continued



1875

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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1876

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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1877

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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1878

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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TABLE 26

Preliminary Forecasts of January-July Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

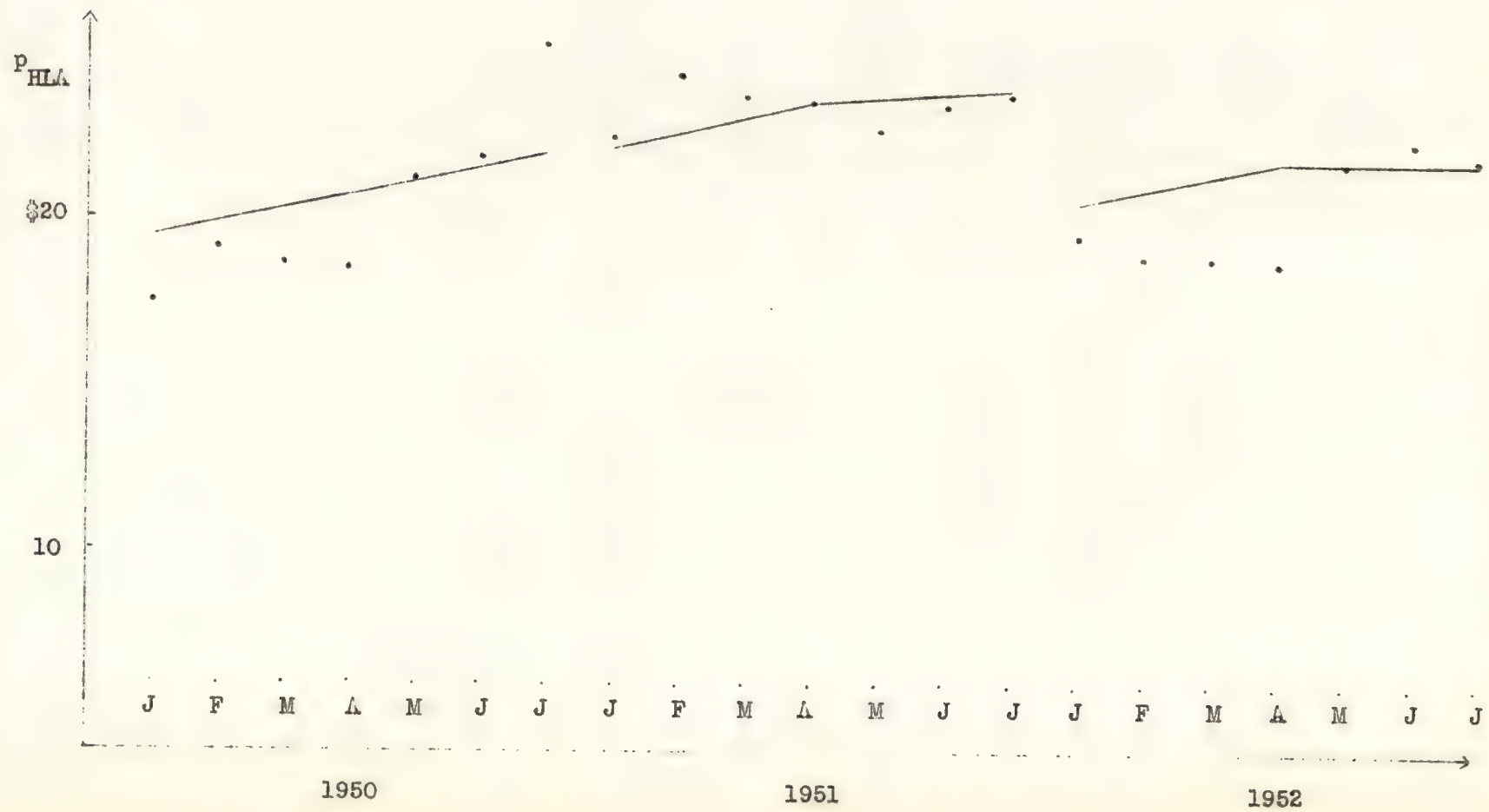
Year	P'_{HLA} ^{a/}	P_{12} ^{b/}	P_1 based on P_{12}	P_4 based on P_{12}	P_7 based on P_{12}	P_7 based on P'_{HLA}	P_7 average	P_1	P_2	P_3	P_4	P_5	P_6	P_7
dollars														
1950	19.28	18.29	19.57	20.78	22.86	21.21	22.04	19.57	19.97	20.38	20.78	21.20	21.62	22.04
1951	20.04	20.81	22.27	23.64	26.01	22.04	24.03	22.27	22.73	23.18	23.64	23.77	23.90	24.03
1952	17.80	19.25	20.60	21.87	24.06	19.58	21.82	20.60	21.02	21.45	21.87	21.85	21.84	21.82
1953	22.75	20.13	21.54	24.47	25.16	25.02	25.09	21.54	22.52	23.49	24.47	24.68	24.88	25.09
1954	21.45	22.54	24.12	25.61	28.18	23.60	25.89	24.12	24.62	25.11	25.61	25.70	25.80	25.89
1955	20.00	17.63	18.86	20.03	22.04	22.00	22.02	18.86	19.25	19.64	20.03	20.69	21.36	22.02
1956	20.94	14.96	16.01	16.99	18.70	23.03	20.86	16.01	16.34	16.66	16.99	18.28	19.57	20.86
1957	24.04	15.85	16.96	18.01	19.81	26.44	23.12	16.96	17.31	17.66	18.01	19.71	21.42	23.12

^{a/} Preliminary estimates made in August of preceding year.

^{b/} Final estimates for P_{12} for previous year.

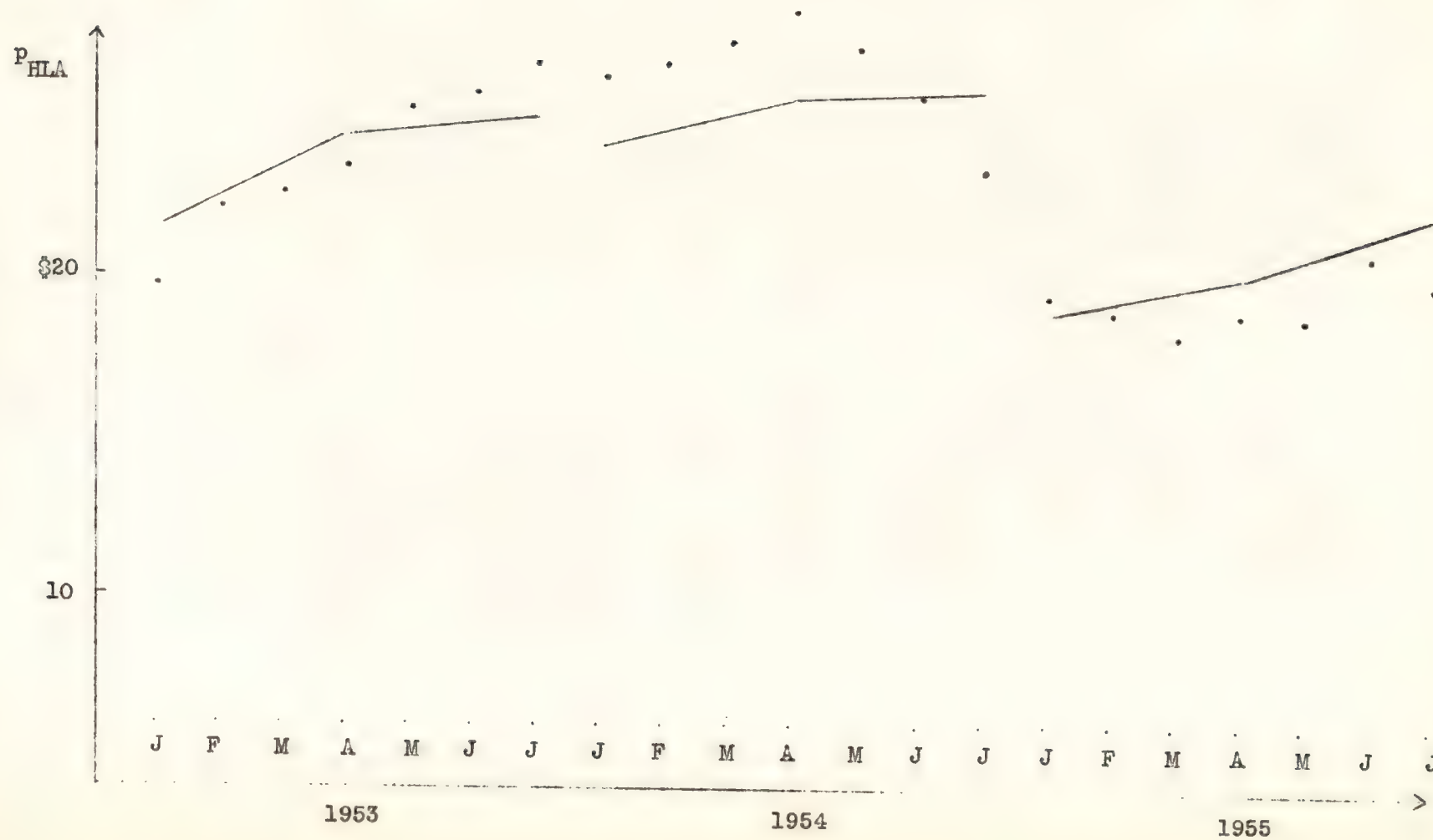
FIGURE 42

Preliminary Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (January-July)



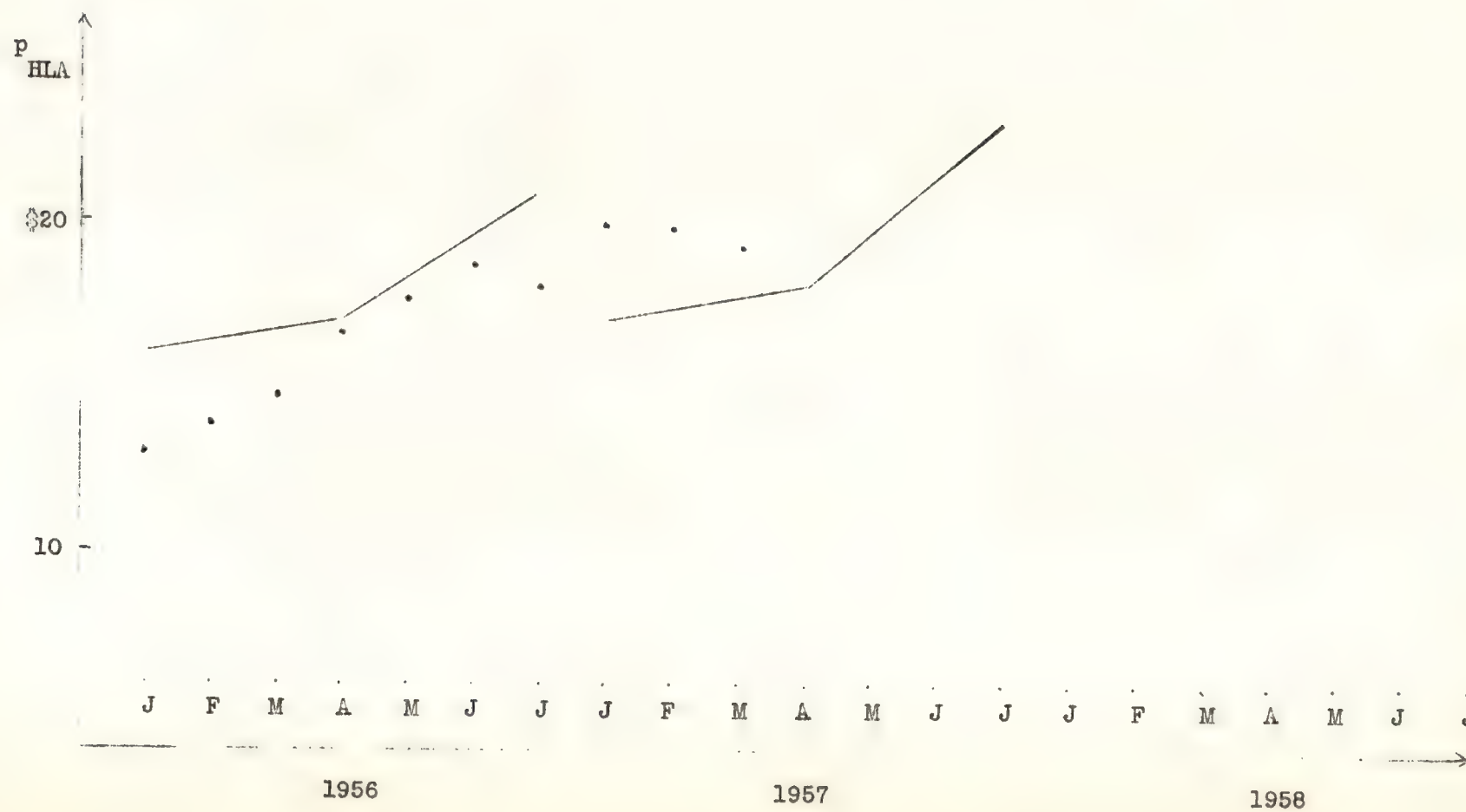
10- 509 de 186 home gilles zingelton pour le fait qu'il n'est pas
E.L. d'après l'acte de mariage d'après la preuve par

FIGURE 42 Continued



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FIGURE 42 Continued



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TABLE 27

Final and Revised Final Forecasts of January-July Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

Year	P_{HLA}^a	p_1	p_2^b	p_4 based on p_1	p_4 based on p_1 on p_2^c	p_4 average	p_7 based on p_1	p_7 based on P_{HLA}	p_7 average	p_3	p_4^d	p_5^d	p_6^d	p_7^d
	dollars													
1949	22.95	23.20	22.25	24.59	20.35	22.47	24.82	25.24	25.03	22.36	22.47	23.32	24.18	25.03
1950	20.60	17.50	18.50	18.55	20.50	19.52	18.72	22.66	20.69	19.01	n.r. ^e 19.52	n.r. 19.91	n.r. 20.30	n.r. 20.69
1951	19.85	22.53	24.00	23.88	26.94	25.41	24.11	21.84	22.98	24.70	n.r. 25.41	n.r. 24.60	n.r. 23.79	n.r. 22.98
1952	20.24	19.50	19.00	20.67	18.00	19.34	20.86	22.26	21.56	19.17	n.r. 19.34	n.r. 20.08	n.r. 20.82	n.r. 21.56
1953	23.86	19.72	20.00	20.90	20.56	20.73	21.10	26.25	23.68	20.36	n.r. 20.73	n.r. 21.71	n.r. 22.70	n.r. 23.68
1954	22.00	26.36	27.00	27.94	28.28	28.11	28.21	24.20	26.20	27.56	22.08 28.11	23.06 27.47	24.05 26.84	25.03 26.20
1955	18.02	19.44	18.38	20.61	16.26	18.44	20.80	19.82	20.31	18.41	n.r. 18.44	n.r. 19.06	n.r. 19.69	n.r. 20.31
1956	21.33	12.95	14.75	13.73	18.35	16.04	13.86	23.46	18.66	15.40	n.r. 16.04	n.r. 19.91	n.r. 17.79	n.r. 18.66
1957	24.17	19.90	20.25	21.09	20.95	21.02	21.29	26.59	23.94	20.64	n.r. 21.02	n.r. 21.99	n.r. 22.97	n.r. 23.94

a/ Revised estimates made in February.

b/ Actual prices for first week of February; also taken as p_2 .

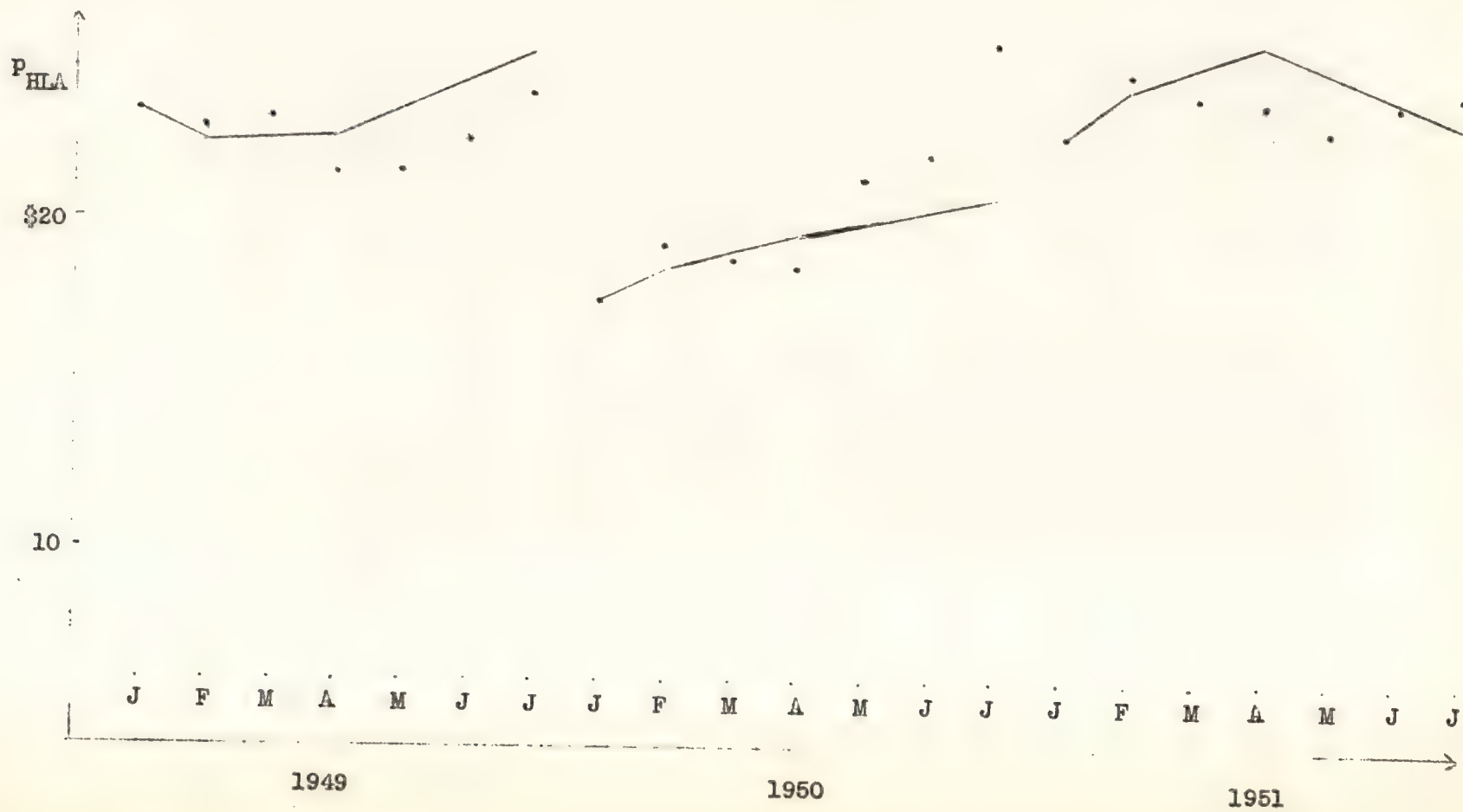
c/ $p_4 = p_1 - 3(p_1 - p_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. No revisions are made unless all estimates for February, March, and April are biased in the same direction and the April bias is greater than \$2.00. The revision for May, June, and July is a parallel extension of the previous estimates and is based on the actual price for April.

e/ N.r. means not revised.

FIGURE 43

Final and Revised Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (January-July)



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155 E. 42ND STREET, NEW YORK 17, N.Y.

1964

FIGURE 43 Continued

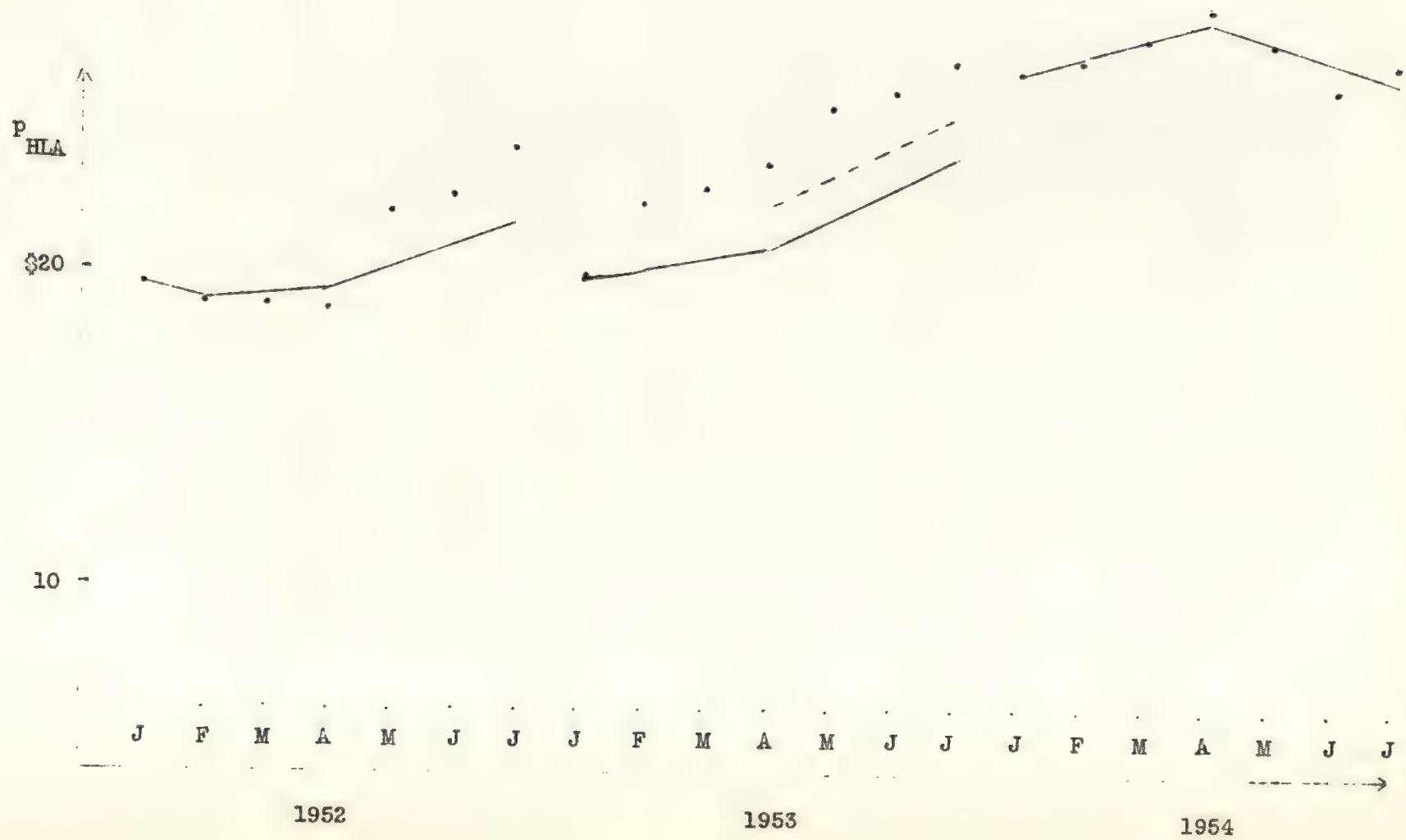


FIGURE 43 Continued

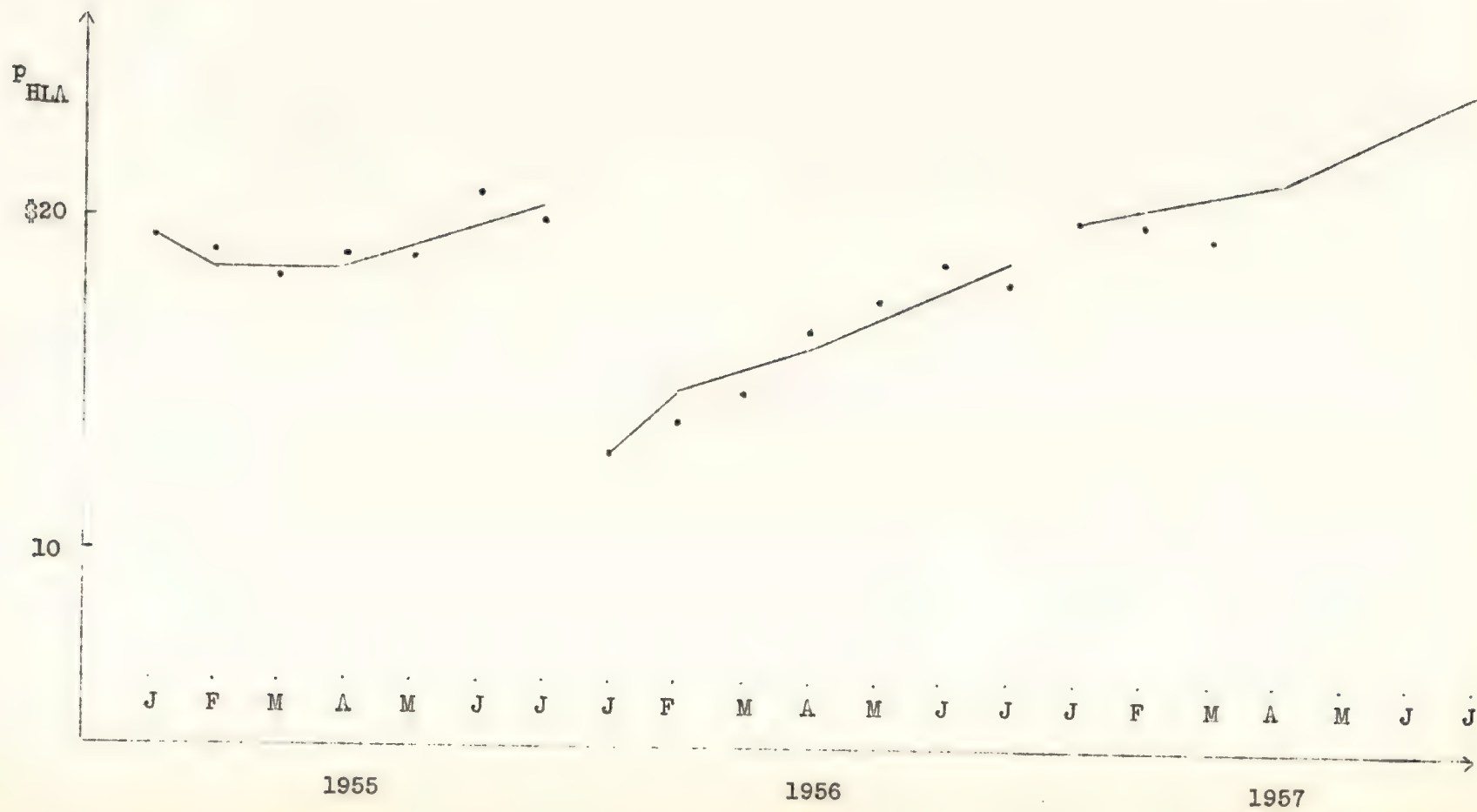


TABLE 28

Preliminary Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

Year	$P'_{BLA} \text{ } ^a/$	$R = 5.0P'_{BLA}$	$p_7 \text{ } ^b/$	p_8 based on p_7	$\frac{\Delta R - 5p_8}{10}$	p_8	p_9	p_{10}	p_{11}	p_{12}
	dollars									
1949	29.29	146.45	26.98	26.98	1.16	26.98	28.14	29.30	30.46	31.62
1950	30.85	154.25	28.78	28.78	1.04	28.78	29.82	30.86	31.90	32.94
1951	31.03	155.15	33.14	33.14	-1.06	33.14	32.08	31.02	29.96	28.90
1952	28.98	144.90	32.68	32.68	-1.85	32.68	30.83	28.98	27.13	25.28
1953	25.77	128.85	26.16	26.16	- .20	26.16	25.96	25.76	25.56	25.36
1954	22.81	114.05	23.84	23.84	- .52	23.84	23.32	22.80	22.28	21.76
1955	22.96	114.80	24.03	24.03	- .54	24.03	23.49	22.95	22.41	21.87
1956	24.15	120.75	22.34	22.34	.91	22.34	23.25	24.16	25.07	25.98
1957	24.86	124.30	22.88	22.88	.99	22.88	23.87	24.86	25.85	26.84

a/ Revised estimates of P_{BLA} made in February.

b/ Final estimates of p_7 made in February.

1. The first part of the paper is devoted to a review of the literature on the topic of the role of the state in the development of the economy. It is found that the state has played a significant role in the development of the economy in many countries, particularly in the case of the United States. The state has been involved in the provision of infrastructure, the regulation of the economy, and the provision of social services. The role of the state has been particularly important in the case of the United States, where the state has been involved in the provision of infrastructure, the regulation of the economy, and the provision of social services. The role of the state has been particularly important in the case of the United States, where the state has been involved in the provision of infrastructure, the regulation of the economy, and the provision of social services.

5. **ADDITIONAL COMMENTS:**

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1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	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TABLE 29

Revised Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

Year	p_4	p_5	$p_6^a/$	p_7 based on p_4 and $p_6^b/$	$S_7' =$ $\sum_{i=1}^7 p_i^c/$	$\bar{p}_{567}^d/$	P_{BLA}' based on $\bar{p}_{567}^e/$	$R =$ $12P_{BLA}' - S_7'$	$\Delta =$ $\frac{R - 5p_8}{10}$	$p_8^f/$	p_9	p_{10}	p_{11}	p_{12}
	dollars													
1949	25.12	25.57	26.50	27.19	175.22	26.42	25.94	136.06	.51	26.20	26.71	27.22	27.73	28.24
1950	26.98	29.49	30.00	31.51	196.51	30.33	29.75	160.49	1.02	30.05	31.07	32.09	33.11	34.13
1951	36.50	36.21	35.00	34.25	248.61	35.15	34.44	164.67	-.92	34.78	33.86	32.94	32.02	31.10
1952	33.11	32.56	32.00	31.44	232.88	32.00	31.37	143.56	-1.48	31.68	30.20	28.72	27.24	25.76
1953	22.57	24.08	24.00	24.72	169.28	24.27	23.85	116.92	-.35	24.09	23.74	23.39	23.04	22.69
1954	23.92	24.83	24.00	24.04	167.20	24.29	23.86	119.12	-.14	24.10	23.96	23.82	23.68	23.54
1955	24.38	24.08	23.25	22.68	166.67	23.34	22.94	108.61	-.72	23.17	22.45	21.73	21.01	20.29
1956	20.44	20.50	20.25	20.16	140.50	20.30	19.98	99.26	-.16	20.18	20.02	19.86	19.70	19.54

a/ Actual prices for first week of June; taken as estimates for p_6 .

b/ Linear extrapolation based on p_4 and p_6^a .

c/ $p_1 + p_2 + p_3 + p_4 + p_5 + p_6^a + p_7$ (based on p_4 and p_6^a).

d/ $1/3 (p_5 + p_6 + p_7$ (based on p_4 and p_6^a)).

e/ Based on using \bar{p}_{567} in equation 13.

f/ p_8 is based on P_{BLA}' based on \bar{p}_{567} .

Δb^2 is small on L_1 small on L_2 .

Let us suppose we have a set of data points (x_i, y_i) for $i = 1, 2, \dots, n$. We want to find a line of best fit, which is a line that minimizes the sum of the squares of the residuals. The residuals are the vertical distances between the data points and the line. The line of best fit is given by the equation $y = mx + b$, where m is the slope and b is the y-intercept. The slope m is given by the formula $m = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sum (x_i - \bar{x})^2}$, and the y-intercept b is given by the formula $b = \bar{y} - m\bar{x}$, where \bar{x} and \bar{y} are the means of the x and y values, respectively.

$$\sqrt{\frac{1}{3}(b^2 + b^2 + b^2)} \text{ (parallel to } b^1 \text{ and } b^2).$$
$$a) b^1 + b^2 + b^3 + b^4 + b^5 + b^6 + b^7 \text{ (полюс на } b^1 \text{ или } b^6).$$

A direct observation was made on $b^{\bar{v}}$ and b^e .

5. Varying prices for this mass of goods: taken as constant for 1910.

[illegible]

100 000 to 1 500 000 people throughout Greece at the village
level. The number of people in the village is not known.

FIGURE 44

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (August-December)

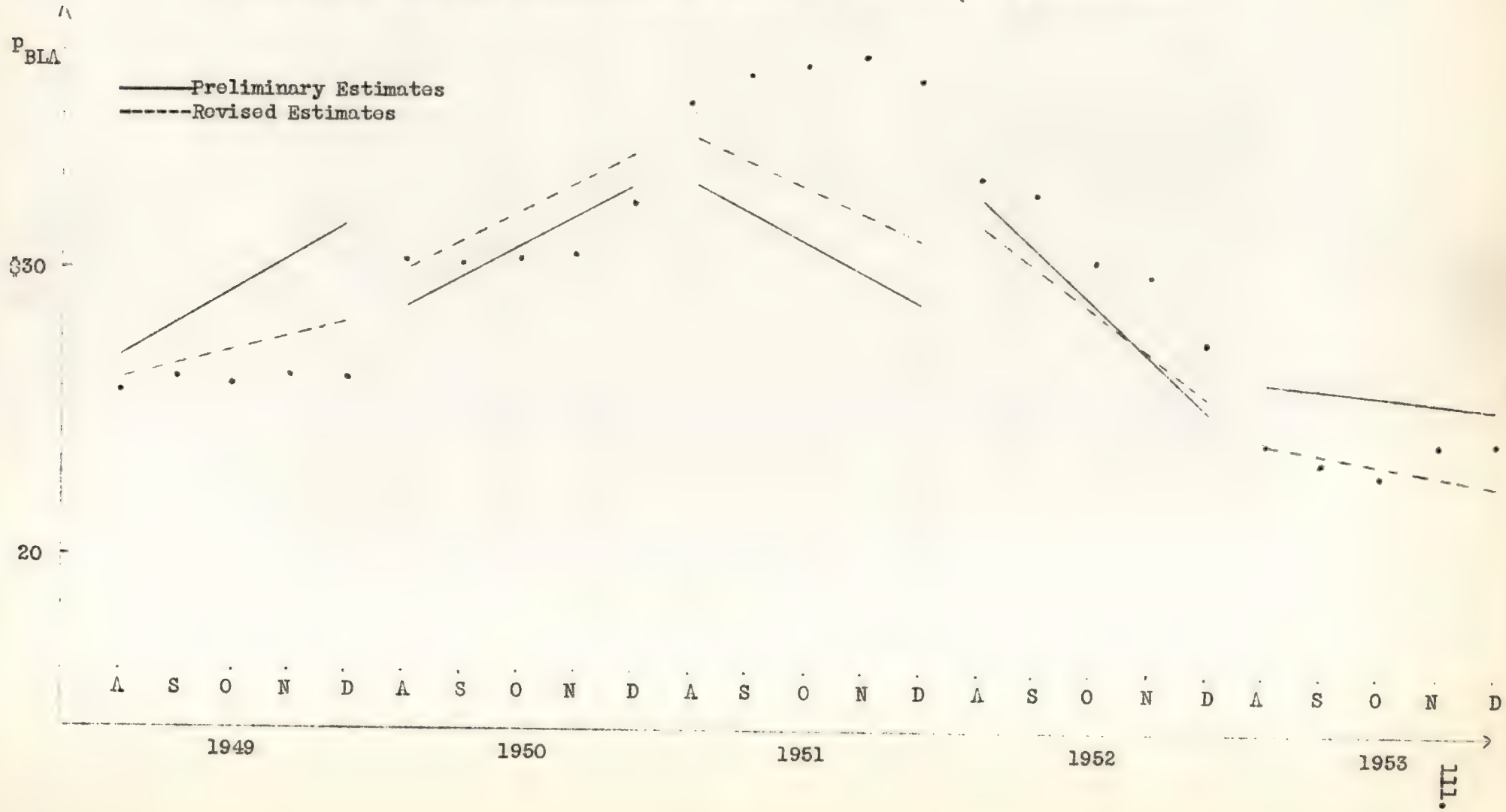
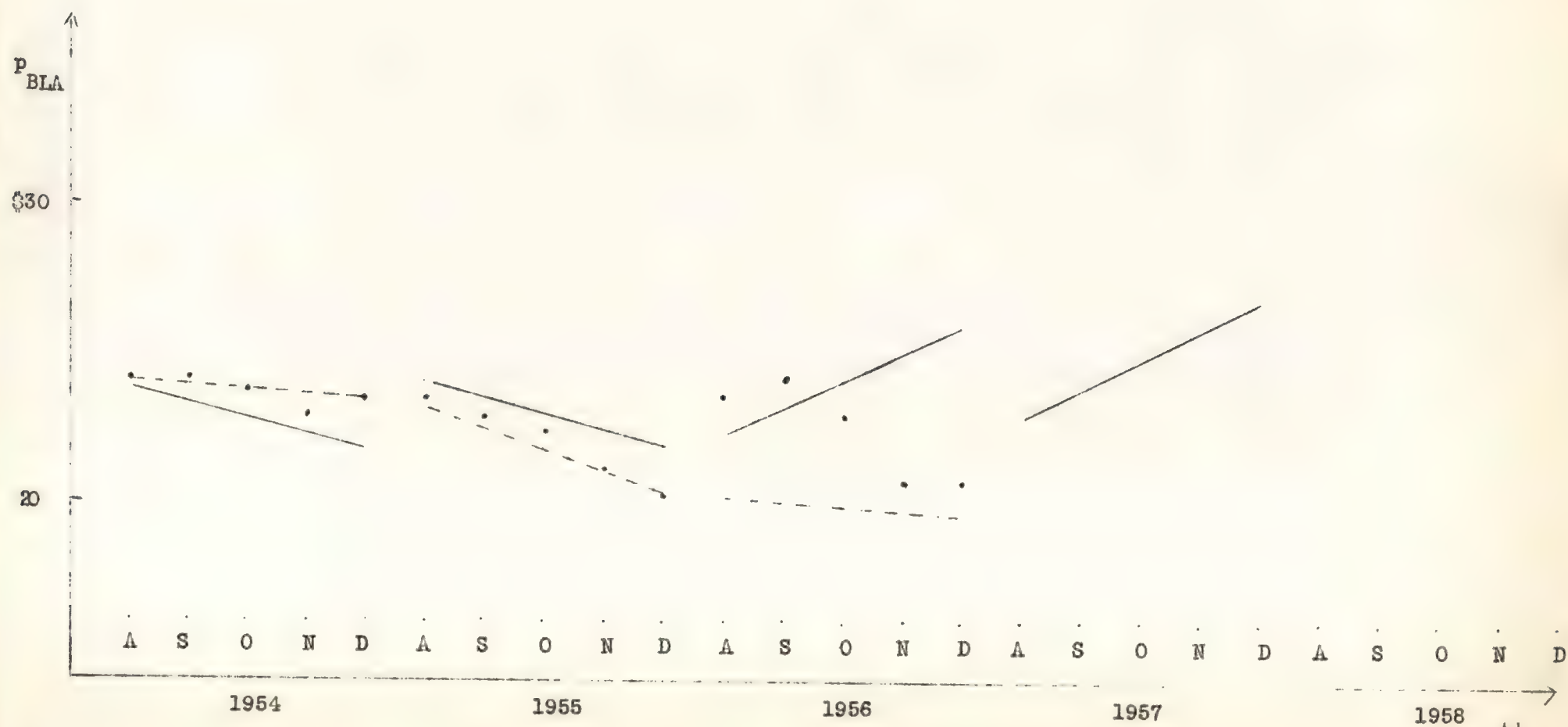


FIGURE 44 Continued



1841

1842

1843

1844

1845

1846

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1847

1848

1849

1850

TABLE 30

Final Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

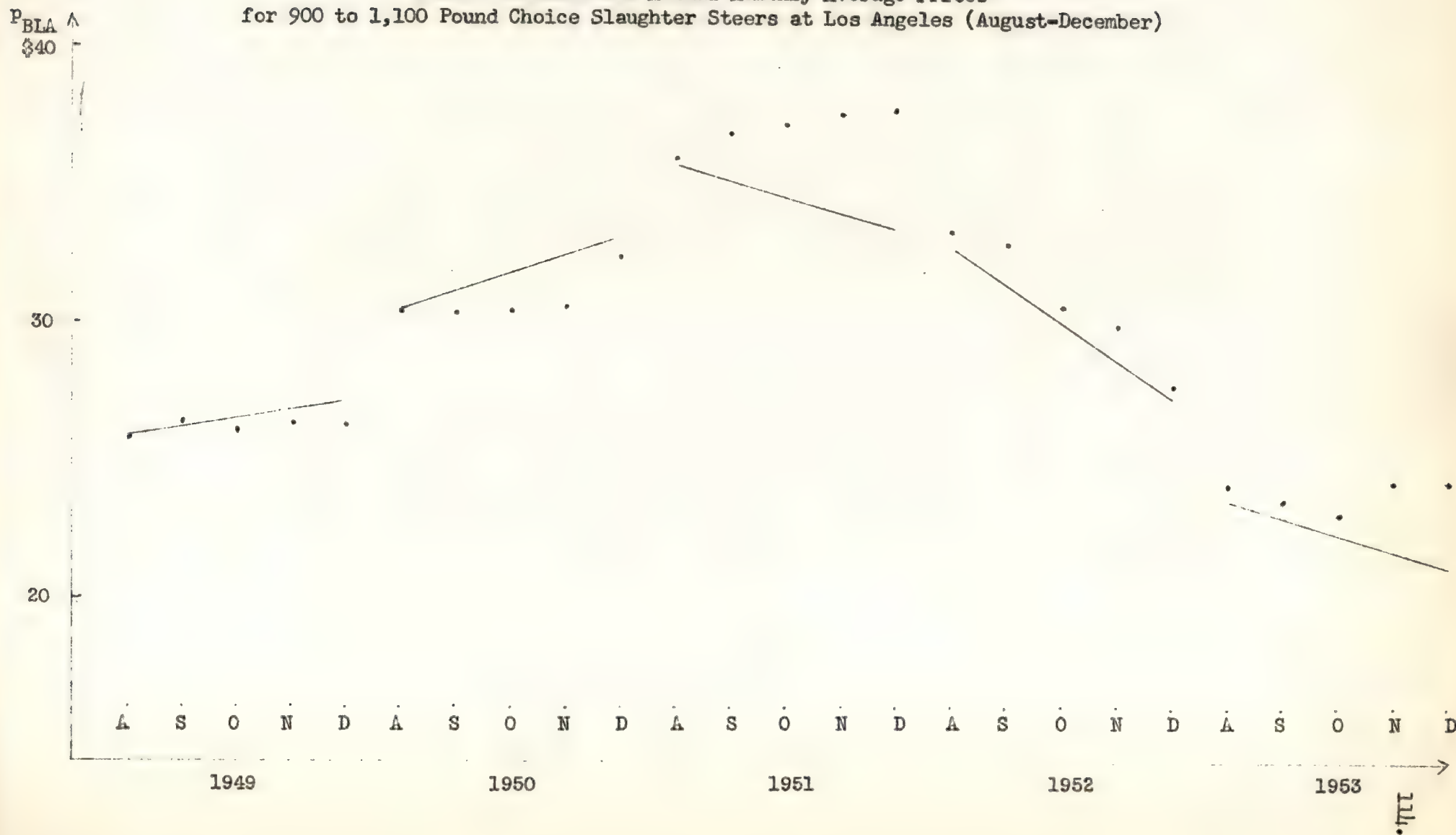
Year	$P'_{BLA} \text{ a/}$	$12P'_{BLA}$	$S_7 = \sum_{i=1}^7 p_i$	$R = 12P'_{BLA} - S_7$	$5\bar{p}$	$\Delta = \frac{R - 5\bar{p}}{10}$	$\bar{p} = \frac{p'_8 + 1.01P'_{BLA}}{2}$	$p_8 \text{ b/}$	p_9	p_{10}	p_{11}	p_{12}	p'_8	$1.01P'_{BLA}$
	dollars													
1949	25.54	306.48	174.00	132.48	129.50	.30	25.90	25.90	26.20	26.50	26.80	27.10	26.00	25.80
1950	29.56	354.72	195.93	158.79	152.15	.66	30.43	30.43	31.09	31.75	32.41	33.07	31.00	29.86
1951	35.36	424.32	251.42	172.90	178.65	-.58	35.73	35.73	35.15	34.57	33.99	33.41	35.75	35.71
1952	32.08	384.96	235.09	149.87	163.50	-1.36	32.70	32.70	31.34	29.98	28.62	27.26	33.00	32.40
1953	23.26	279.12	267.50	111.62	117.50	-.59	23.50	23.50	22.91	22.32	21.73	21.14	23.50	23.49
1954	24.03	288.36	167.72	120.64	121.80	-.12	24.36	24.36	24.24	24.12	24.00	23.88	24.45	24.27
1955	23.36	280.32	167.97	112.35	117.75	-.54	23.55	23.55	23.01	22.47	21.93	21.39	23.50	23.59
1956	20.84	250.08	143.12	106.96	110.15	-.32	22.03	23.00	22.68	22.36	22.04	21.72	23.00	21.05

a/ Final estimates (2).

b/ p_8 is taken as \bar{p} if $|p'_8 - 1.01P'_{BLA}| < \1.75 ; otherwise, $p_8 = p'_8$. p'_8 is actual average price for first week of August.

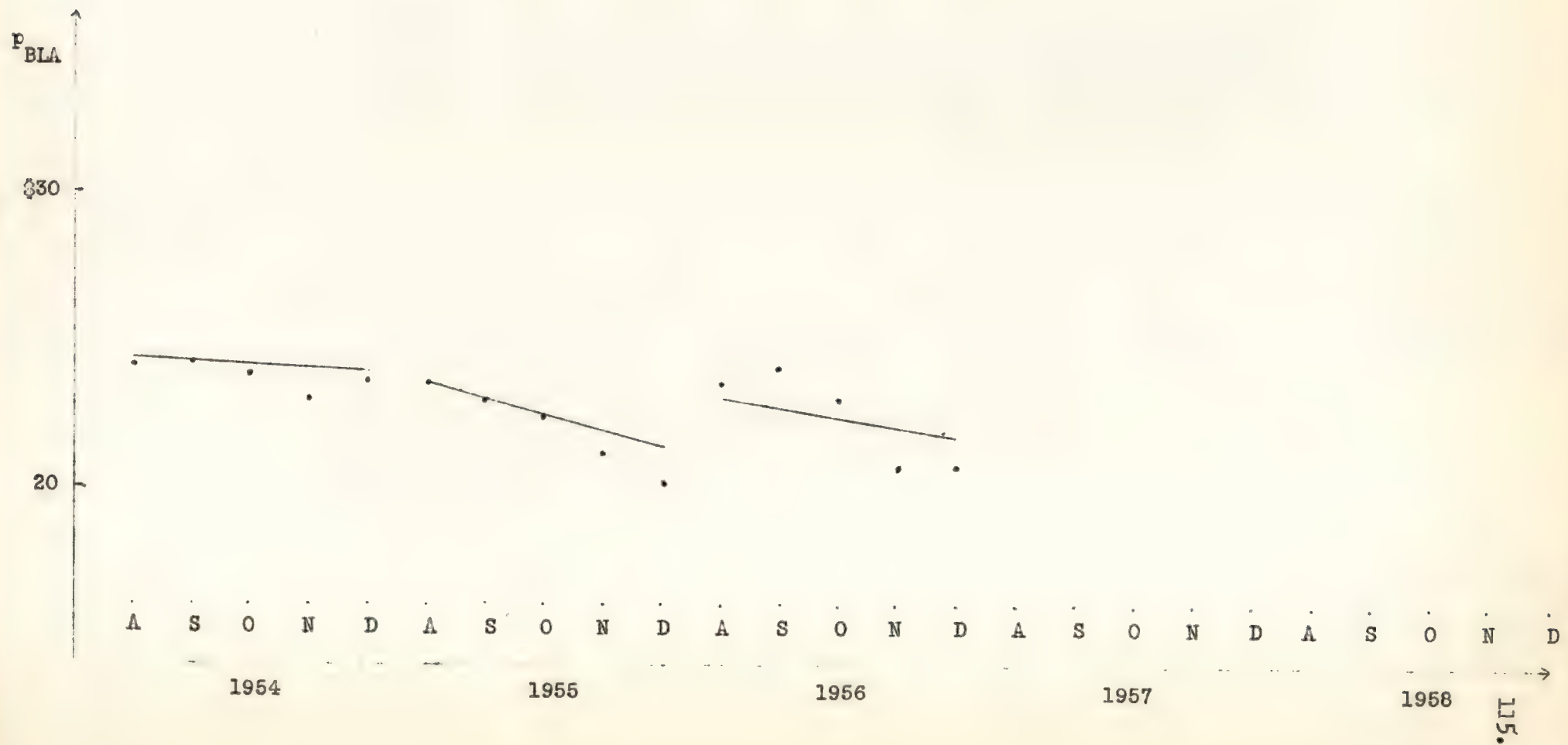
FIGURE 45

Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (August-December)



For 500 to 1,000 being charged elsewhere at low rates (higher-charge)

FIGURE 45 Continued



1. The first part of the paper is devoted to a general discussion of the problem. It is shown that the problem is of great importance in the theory of differential equations and in the theory of the calculus of variations.

2. In the second part of the paper, the author considers the case of a linear differential equation. It is shown that the problem can be reduced to a problem of the calculus of variations. The author then gives a detailed analysis of this problem and shows that it can be solved by the method of the calculus of variations.

3. In the third part of the paper, the author considers the case of a nonlinear differential equation. It is shown that the problem can be reduced to a problem of the calculus of variations. The author then gives a detailed analysis of this problem and shows that it can be solved by the method of the calculus of variations.

4. In the fourth part of the paper, the author considers the case of a system of differential equations. It is shown that the problem can be reduced to a problem of the calculus of variations. The author then gives a detailed analysis of this problem and shows that it can be solved by the method of the calculus of variations.

5. In the fifth part of the paper, the author considers the case of a system of differential equations with boundary conditions. It is shown that the problem can be reduced to a problem of the calculus of variations. The author then gives a detailed analysis of this problem and shows that it can be solved by the method of the calculus of variations.

TABLE 31

Preliminary Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

Year	p_6^a	P'_{HLA} based on p_6^b	$12P'_{HLA}$	$S'_7 =$ $\sum_{i=1}^7 p_i^c$	$R =$ $12P'_{HLA} - S'_7$	p_8 based on p_6	$\Delta =$ $\frac{R - 5p_8}{9}$	p_8	p_9	p_{10}	p_{11}	p_{12}
	dollars											
1949	24.18	22.55	270.60	162.81	107.79	24.66	-1.72	24.66	22.94	21.22	19.50	19.50
1950	20.30	18.58	222.96	135.43	87.53	20.71	-1.78	20.71	18.93	17.15	15.37	15.37
1951	23.79	22.15	265.80	168.01	97.79	24.27	-2.50 ^d	24.27	21.77	19.27	16.77	16.77
1952	20.82	19.11	229.32	139.47	89.85	21.24	-1.82	21.24	19.42	17.60	15.78	15.78
1953	22.70	21.04	252.48	148.90	103.58	23.15	-1.35	23.15	21.80	20.45	19.10	19.10
1954	26.84	25.28	303.36	189.54	113.82	27.38	-2.50 ^d	27.38	24.88	22.38	19.88	19.88
1955	19.69	17.95	215.40	133.73	81.67	20.08	-2.08	20.08	18.00	15.92	13.84	13.84
1956	17.79	16.00	192.00	115.50	76.50	18.15	-1.58	18.15	16.57	14.99	13.41	13.41
1957	22.97	21.31	255.72	150.71	105.01	23.43	-1.35	23.43	22.08	20.73	19.38	19.38

a/ Final estimates made in February of given year.

b/ p_6 is used in equation 14 as an estimate of \bar{p}_{567} since p_5 , p_6 , and p_7 , as estimated, lie on a straight line.

c/ S'_7 is the sum of the January-July final estimates.

d/ Whenever Δ , as computed, is less than -2.50, then $\Delta = -2.50$ is used.

TABLE 32

Revised Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

Year	$p_6^{'a/}$	$P_{HLA}^{'}$ based on $p_6^{'b/}$	p_7 based on $p_6^{'}$	p_8 based on $p_6^{'}$	$12P_{HLA}^{'}$	$S_7^{'}$ = $\sum_{i=1}^7 p_i^{'c/}$	$R =$ $12P_{HLA}^{'} - S_7^{'}$	$\Delta =$ $\frac{R - 5p_8^{'d/}}{9}$	p_8	p_9	p_{10}	p_{11}	p_{12}
dollars													
1949	22.50	20.83	23.18	22.95	249.96	157.28	92.68	-2.45	22.95	20.50	18.05	15.60	15.60
1950	21.50	19.81	22.14	21.93	237.72	138.77	98.95	-1.19	21.93	20.74	19.55	18.36	18.36
1951	23.88	22.24	24.60	24.36	266.88	165.50	101.38	-2.27	24.36	22.09	19.82	17.55	17.55
1952	22.62	20.95	23.30	23.07	251.40	143.89	107.51	-.87	23.07	22.20	21.33	20.46	20.46
1953	26.25	24.67	27.04	26.78	296.04	166.60	129.44	-.50	26.78	26.28	25.78	25.28	25.28
1954	27.25	25.70	28.07	27.80	308.40	191.48	116.92	-2.45	27.80	25.35	22.90	20.45	20.45
1955	19.50	17.76	20.08	19.89	213.12	133.80	79.32	-2.24	19.89	17.65	15.41	13.17	13.17
1956	18.75	16.99	19.31	19.12	203.88	113.58	90.30	-.59	19.12	18.53	17.94	17.35	17.55

a/ Actual prices for first week of June.

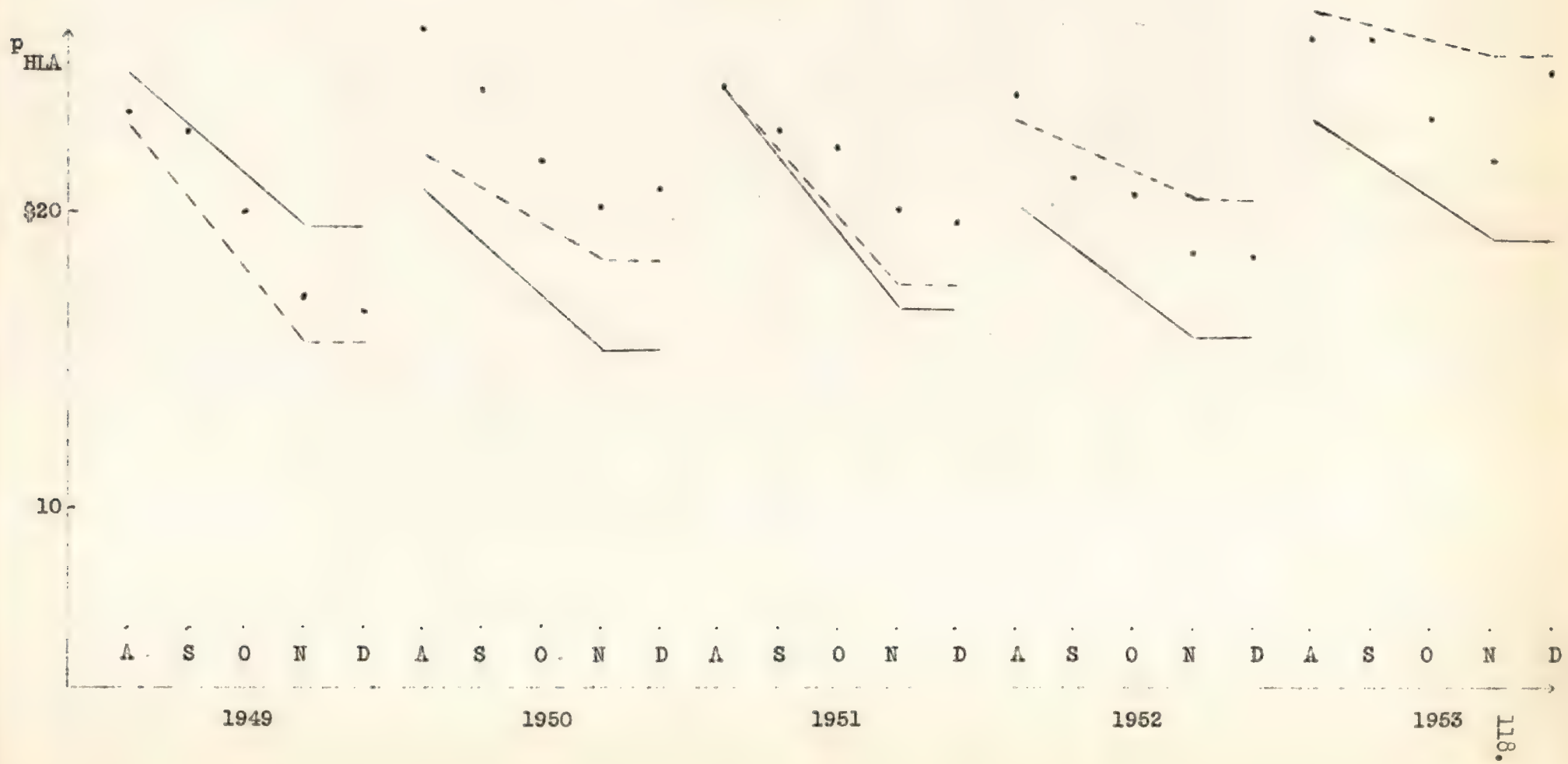
b/ $p_6^{'}$ is used in equation 14 as an estimate of \bar{p}_{567} .

c/ $S_7^{'}$ = $(p_1 + p_2 + p_3 + p_4 + p_5 + p_6^{'}$ (based on $p_6^{'}$)).

d/ If Δ is less than -2.50 when computed, then $\Delta = -2.50$ is used.

FIGURE 46

Preliminary and Revised ~~Forecasts~~ and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (August-December)



1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100

For the 2020 Census, the Census Bureau is conducting a test of the new census questions. The test is being conducted in a small number of households. The results of the test will be used to determine if the new questions are appropriate for the 2020 Census. The test is being conducted in a small number of households. The results of the test will be used to determine if the new questions are appropriate for the 2020 Census.

FIGURE 46 Continued

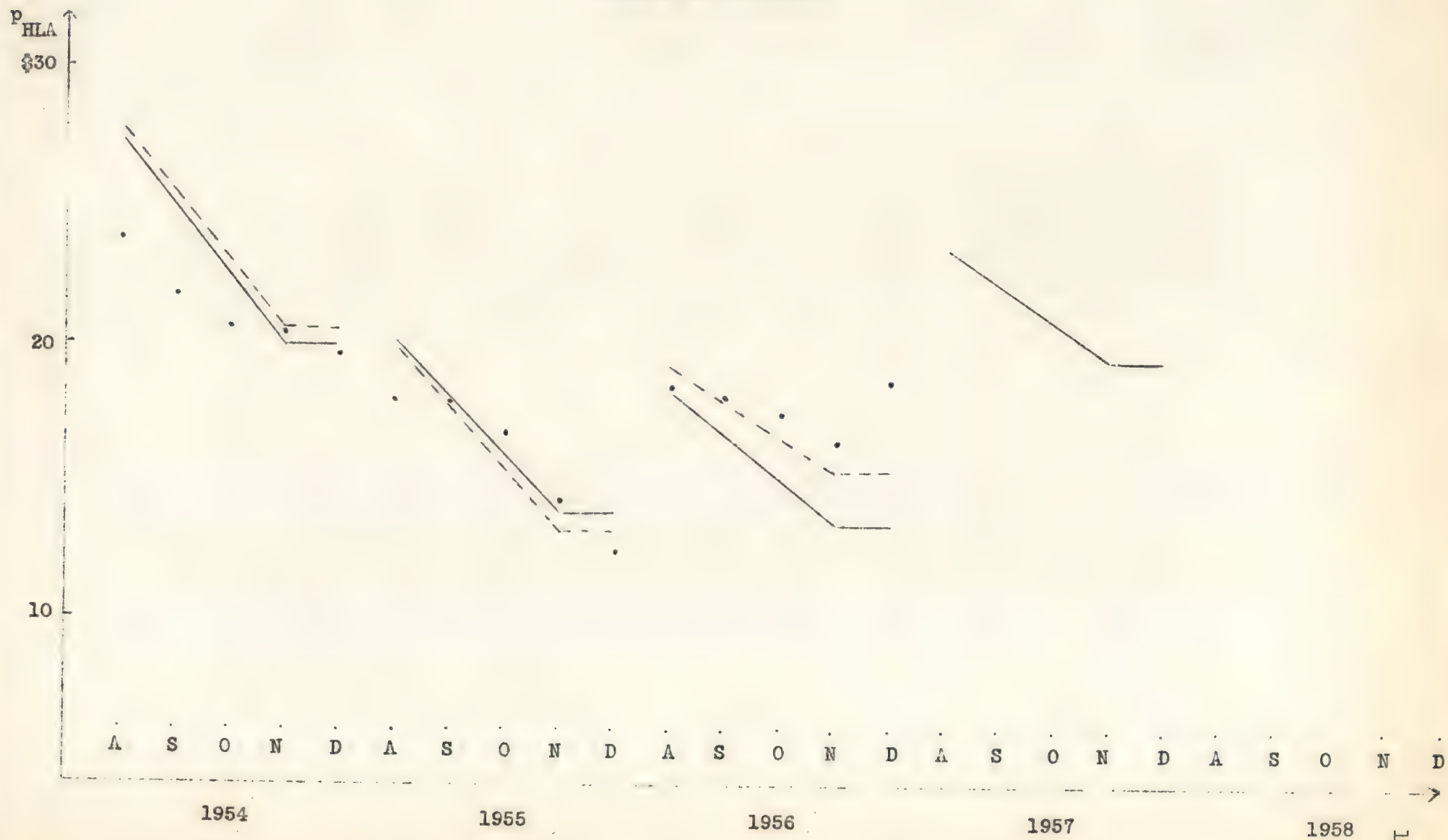


TABLE 33

Final Forecasts of August-December Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

Year	$P'_{HLA} \text{ a/}$	$12P'_{HLA}$	$S_7 = \sum_{i=1}^7 p_i$	$R = 12P'_{HLA} - S_7$	$\bar{R} = 4.89P'_{HLA}$	$\bar{p} = \frac{p'_8 + 1.09P'_{HLA}}{2}$	$\Delta = \frac{R' - 5p'_b/}{9}$	$p'_8 \text{ c/}$	p_9	p_{10}	p_{11}	p_{12}	p'_8	$1.09P'_{HLA}$
dollars														
1949	20.83	249.96	157.72	92.24	101.86	23.48	-1.73	23.48	21.75	20.02	18.29	18.29	24.25	22.70
1950	21.16	253.92	142.40	111.52	103.47	24.53	-1.24	24.53	23.29	22.05	20.81	20.81	26.00	23.06
1951	21.70	260.40	164.32	96.08	106.11	24.20	-1.65	24.20	22.55	20.90	19.25	19.25	24.75	23.65
1952	21.08	252.96	144.31	108.65	103.08	24.12	-1.33	24.12	22.79	21.46	20.13	20.13	25.25	22.98
1953	24.38	292.56	165.85	126.71	119.22	25.78	-1.08	25.78	24.70	23.62	22.54	22.54	25.00	26.57
1954	23.92	287.04	185.36	101.68	116.97	24.38	-2.25	24.38	22.13	19.88	17.63	17.63	22.68	26.07
1955	18.02	216.24	134.73	81.51	88.12	18.32	-1.12	18.32	17.20	16.08	14.96	14.96	17.00	19.64
1956	16.30	195.60	112.18	83.42	79.71	17.95	- .70	17.95	17.25	16.55	15.85	15.85	18.13	17.77

a/ Final estimates (2).

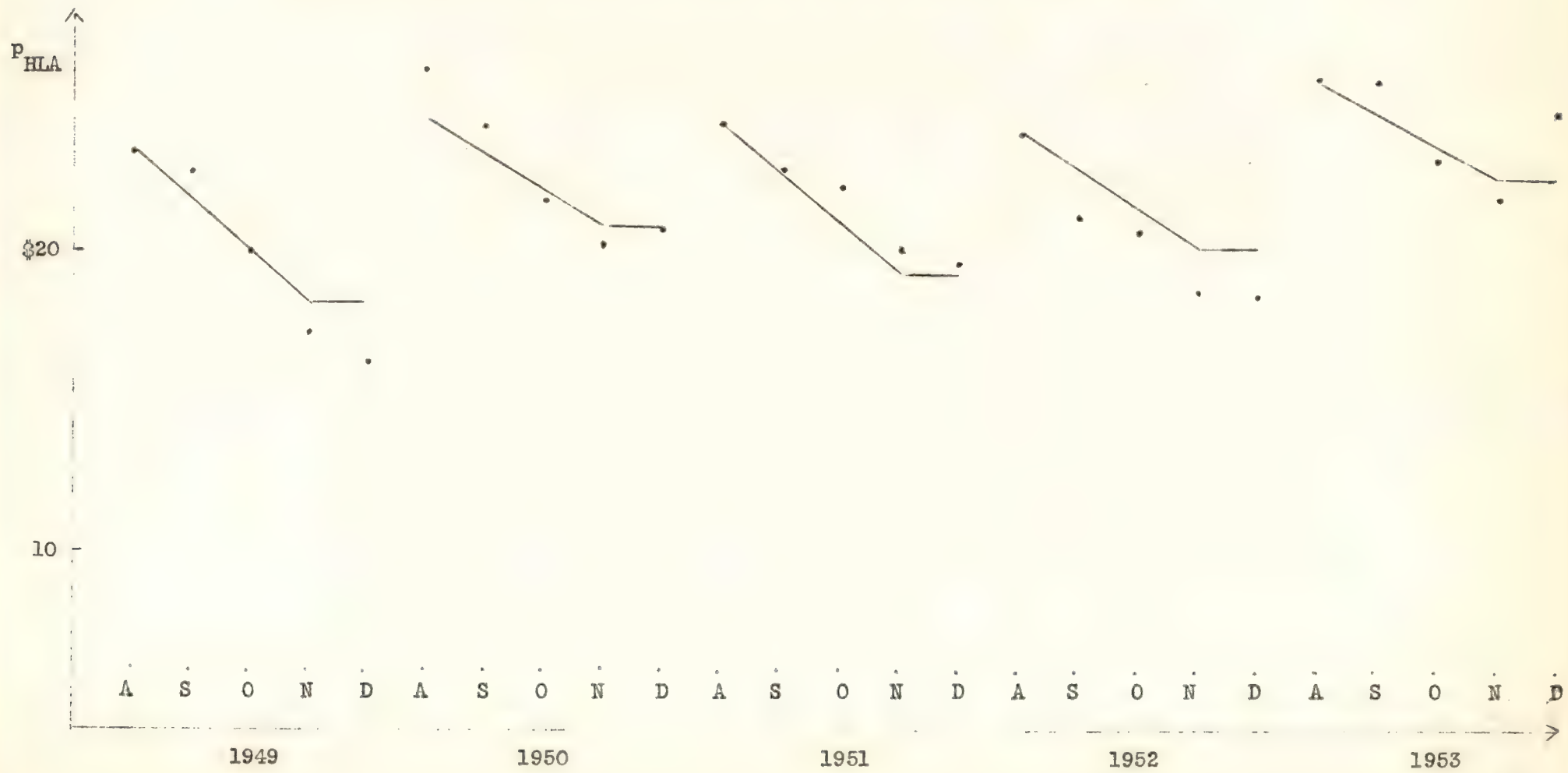
b/ R' is larger or smaller of R or \bar{R} depending on whether p'_8 is greater or smaller than $1.09P'_{HLA}$. Furthermore, $p' = \bar{p}$ unless $|\Delta| > 2.50$. Otherwise, $p' = p'_8$. p'_8 is actual average price for first week of August

c/ $p_8 = p'$.

[illegible]

FIGURE 47

Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (August-December)



100

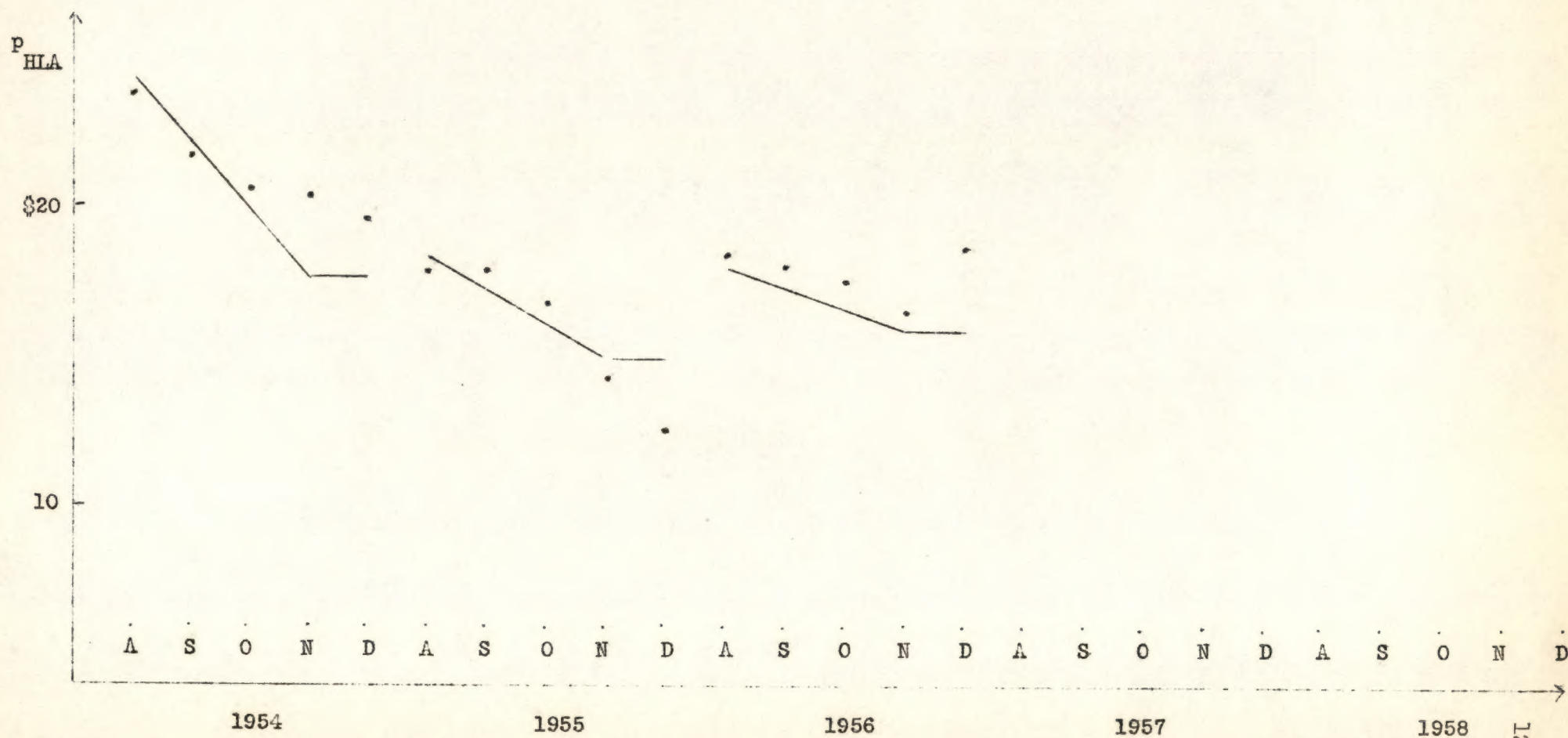
10

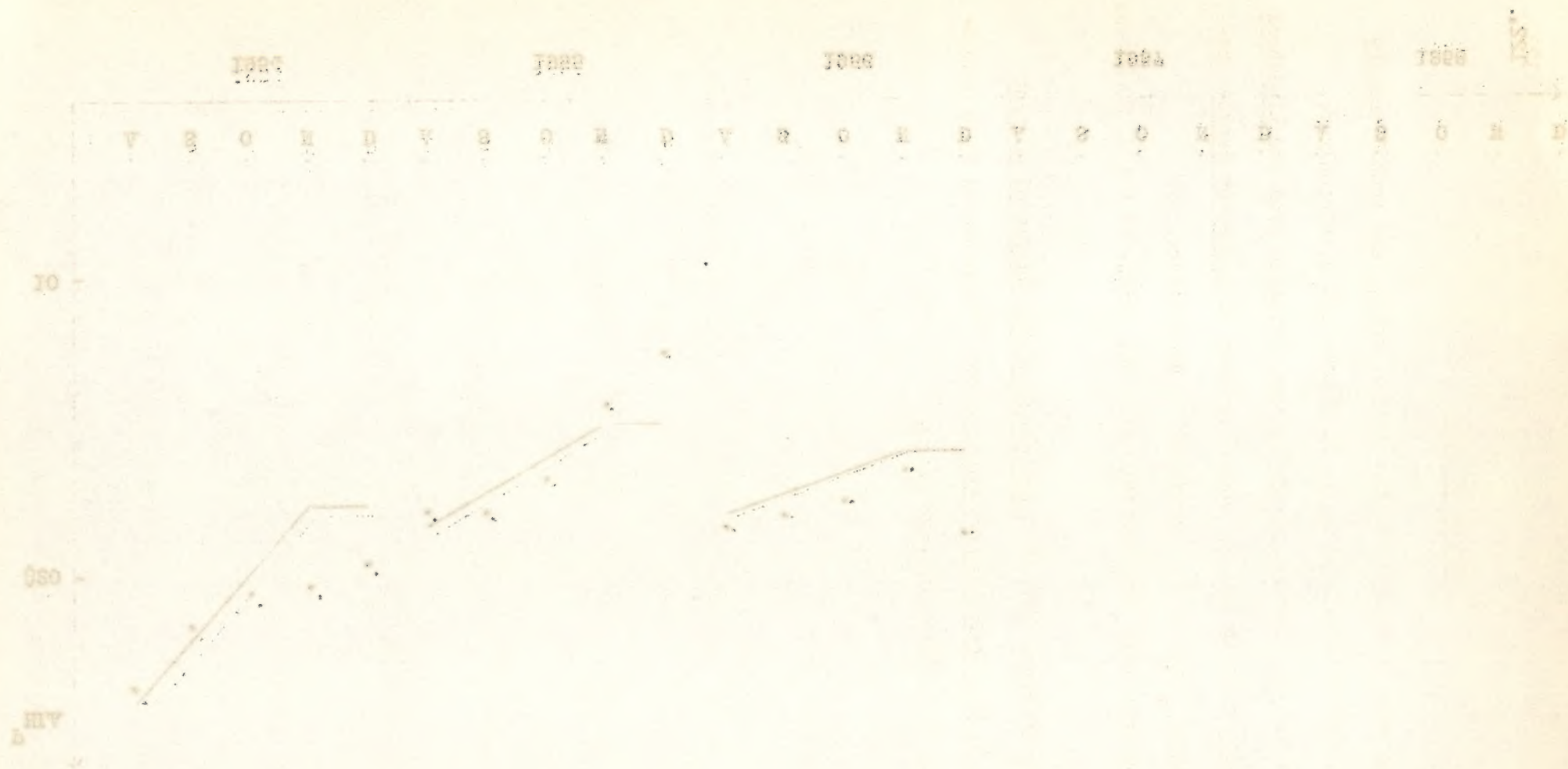
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FIGURE 47 Continued





LEADS - 12 MONTHS

Sources of Data

1. Livestock prices were obtained from the daily, weekly, and annual summary releases of the Market News Service, U. S. Department of Agriculture.
2. Production data for the livestock industry were obtained from the Livestock and Meat Situation reports and the annual release on Livestock Market Statistics and Related Data, U. S. Department of Agriculture.
3. Human population data were obtained from the P-25 series of the U. S. Bureau of the Census.
4. Income data were obtained from the Supplement to the Survey of Current Business of the U. S. Department of Commerce and from numerous other publications carrying these data for past years.

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